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POPULATION DENSITY AND MUNICIPAL DEVELOPMENT
- THE VANCOUVER, B.C., METROPOLITAN AREA -

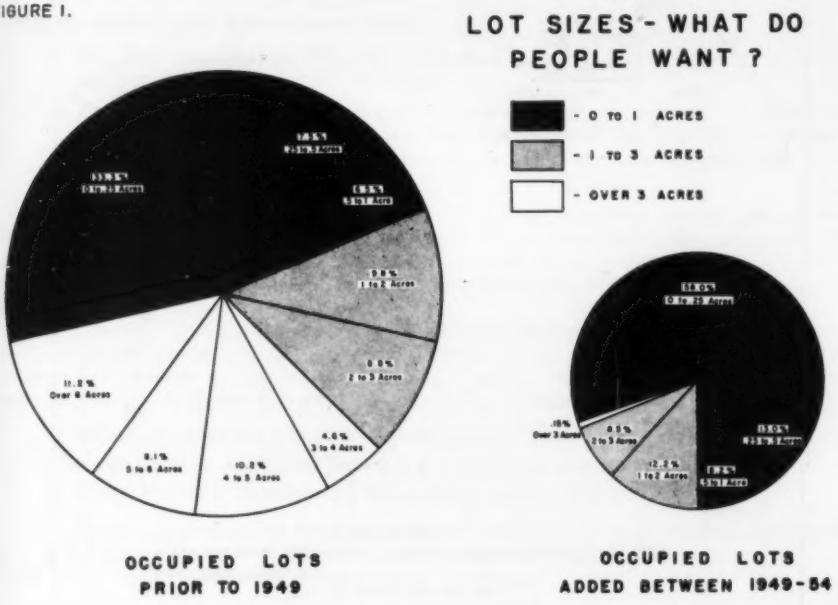
A.D. Crerar

Lower Mainland Regional Planning Board of British Columbia

Probably the most arresting phenomenon of the post-war period has been the explosive growth of metropolitan agglomeration such as Greater Montreal, Toronto and Vancouver. Each census shows that increasing percentages of Canadians are to be found within the bounds of metropolitan areas. There has been much speculation on the social, technical and economic forces underlying this flight to the city but as yet little detailed material is available on how metropolitan growth takes place, the development pattern it forms and the consequences of such patterns to municipal governments.

This paper will attempt to examine some aspects of urban growth as it applies to the metropolitan area of the Lower Mainland of British Columbia or the Greater Vancouver area.[1]

FIGURE I.



OCCUPIED LOTS PRIOR TO 1949

OCCUPIED LOTS ADDED BETWEEN 1949-54

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[1] The area involved is that defined as the Vancouver Metropolitan Area in the 1951 census.

As a whole the Greater Vancouver metropolitan area is growing rapidly. During the period from 1941 to 1951 the population increased from 375, 000 to 521, 000, an increase of 41 per cent, but in common with other metropolitan areas the central city, Vancouver, lost some of its dominating importance, dropping from 73 per cent of the total population of the metropolitan area in 1941 to 66 per cent in 1951. Vancouver City also showed the smallest percentage growth, 25 per cent, of any of the metropolitan municipalities during the decade 1941 to 1951. The greatest growth both by percentage and numerically has been experienced by municipalities on the fringe of the metropolitan area. Peripheral expansion is occurring in areas which have experienced little previous development, and new growth has therefore an optimum choice of the pattern of development to be followed. In the central city new growth is principally an intensification of patterns of development set previously.

What type of development has occurred in the growing municipalities? (Figure 1). Examination in one of the typical fringe municipalities, Surrey, shows that only a minority of new settlers want acreage holdings, or small holdings over one acre in size. In Surrey 80 per cent of the new lots developed between 1949 and 1954 were under one acre in size. Most new development therefore occurs on lots of normal urban size.[1]

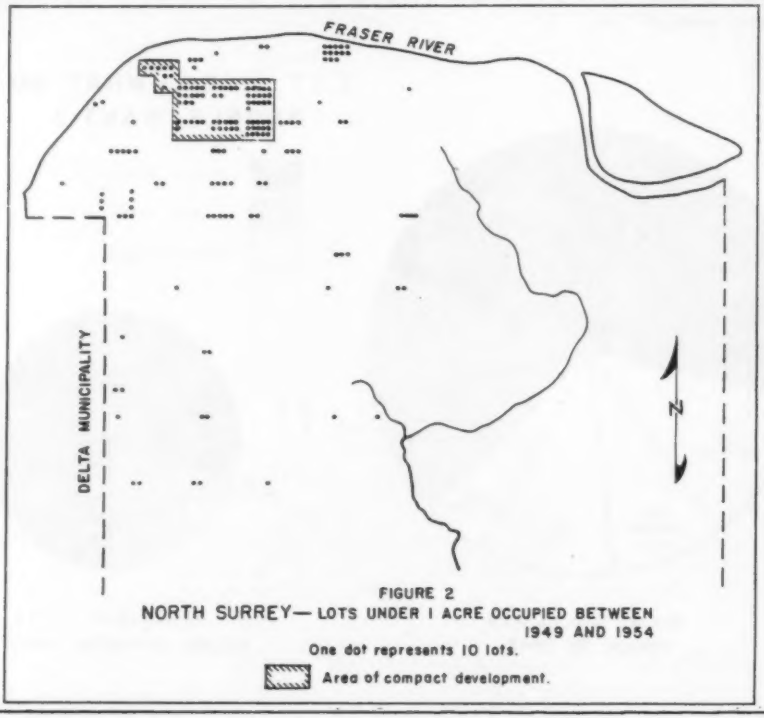

FIGURE 2
NORTH SURREY— LOTS UNDER 1 ACRE OCCUPIED BETWEEN 1949 AND 1954

[1] Details of the lot sizes occupied are shown on Figure 1. It is of interest to note that more than half of the new development occurred on lots of less than 0. 25 acres in size.

To a degree these newly occupied lots have been located in compact groups. On the map of North Surrey the location of new homes built on lots less than one acre has been shown by dots, each dot representing 10 houses occupied during the period from 1949 to 1954. (Figure 2). Of the 1,700 homes occupied during this period 750 or 44 per cent were located on only 1.75 square miles out of a total of 50 square miles available for settlement. To this extent a spontaneous concentration of homes occurred to form a true urban community known as the Whalley area.[1] During the period under review, there were no building schemes involving more than 10 houses, therefore concentration did not result from large scale speculative building.

In contrast to this natural concentration the remaining 940 homes, or 56 per cent of new construction, were scattered far and wide throughout the map area.

What are the reasons for these patterns of concentration and scatter? Factors which favour scatter are:

1. The general similarity of services (already noted). Water services are supplied everywhere, roads both in areas of concentration and of scatter are gravelled; septic tanks are required in all areas and zoning restrictions are uniform.
2. Almost every family has a car and is not dependent on public transit.
3. Lot prices tend to decrease away from centres of concentration.

Factors which favour concentration are:

1. Relative closeness to shopping and schools, an important consideration for the housewife in a one car family.
2. Families are attracted to an area of concentration because sufficient development has taken place to judge the final character of the district. Isolated homes in an area of scatter may in future years be surrounded by low value construction.

In general, it is difficult to advance really valid reasons why as much concentration has occurred as has in fact been the case. It would seem that there are strong tendencies toward the formation of urban communities, probably based on simple gregariousness, which operate even when scattered building sites are available, providing identical services at a lower initial cost.

The final results of the two opposing tendencies can best be seen from the map of gross population densities in Surrey in 1955. (Figure 3). Four groups are shown: 1) Over 3.5 persons per acre. 2) 1.2 to 3.5 persons per acre. 3) 0.3 to 1.2 persons per acre. 4) Under 0.3 persons per acre. Three categories may be described:

1. Urban or Suburban Areas - Density over 3.5 persons per acre.[2]
2. Sprawl Areas - Density between 0.3 and 3.5 persons per acre.
3. Farm Areas - Density less than 0.3 persons per acre.

These categories are based on economic examinations of several municipalities of the Lower Mainland and on frequency distribution of densities by quarter sections in two municipalities of the metropolitan fringe.

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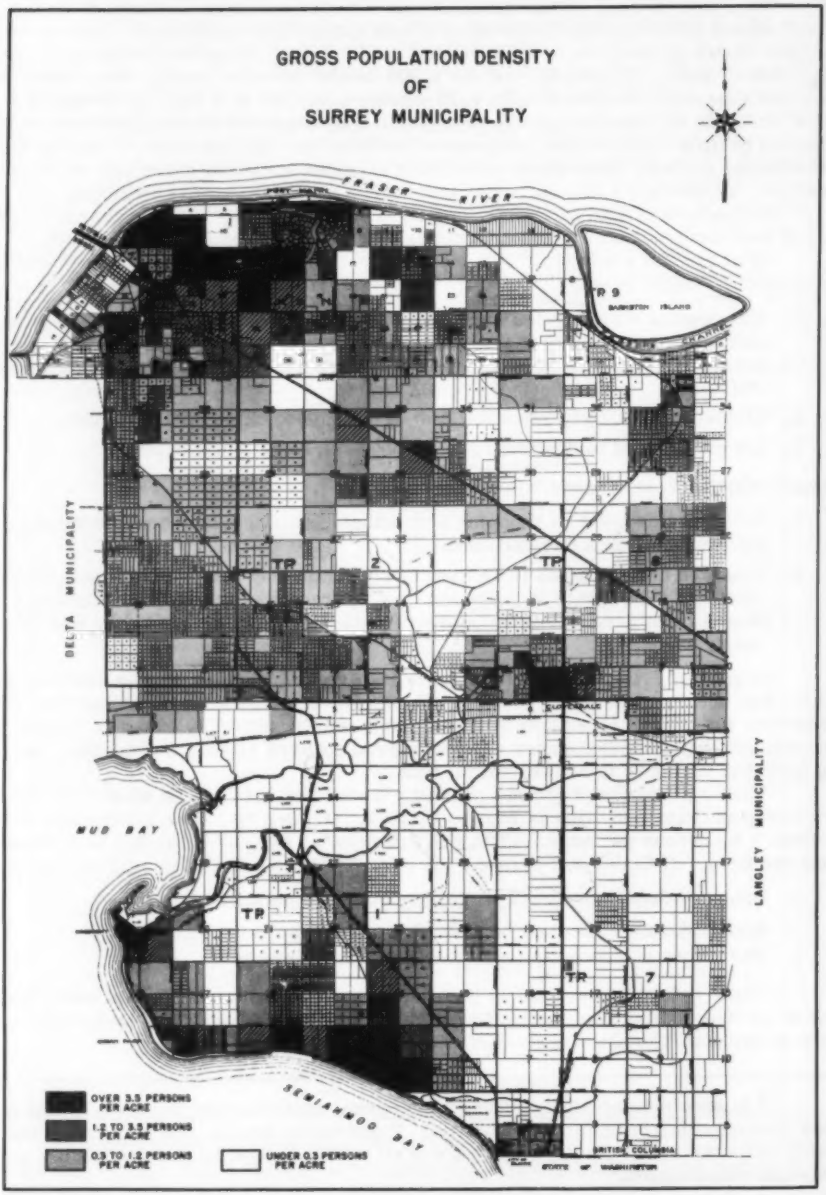
[1] It should be noted that during the period under survey the whole of the map area presented fairly uniform conditions. Piped water was available at any point, septic tanks were universally required and no zoning restrictions were applied on residential construction.

[2] All densities are gross densities.


GROSS POPULATION DENSITY
OF
SURREY MUNICIPALITY
FRASER RIVER
TP 9
BARNSTON ISLAND
DELTA MUNICIPALITY
LANGLEY MUNICIPALITY
MUD BAY
SEMIAHMOO BAY
TP
OVER 3.5 PERSONS PER ACRE
1.2 TO 3.5 PERSONS PER ACRE
0.5 TO 1.2 PERSONS PER ACRE
UNDER 0.5 PERSONS PER ACRE
BRITISH COLUMBIA
STATE OF WASHINGTON

The typical land use pattern represented by the categories is:

Farm Areas - holdings are generally over 12 acres in size and used for full-time commercial farming.

Urban and Suburban Areas - the use is typically urban-residential in single family dwellings.

Sprawl Areas are transition zones between these two types of development. They may consist of "ribbon development" along a main highway, lined it seems to infinity, by houses, shops of all kinds, small industries, wrecking yards, and so forth. This line of houses is however, only a facade; like a stage set, it has no depth. Behind it is undeveloped countryside.

Another type of sprawl is the subdivision that did not "catch" with a lot occupied here and there while the remaining lots stand empty. Sprawl also may occur where acreage holdings of two, three or five acres dominate on an areal basis while the homes on standard urban lots (less than one acre in size), sprinkled haphazardly throughout the area, contain the bulk of population.

These types of sprawl are not mutually exclusive, they may occur simultaneously or in any combination. They all have one factor in common however, low population density - in all cases examined between 0.3 and 3.5 people per acre.

The various types of sprawl comprise 55 per cent of new building occurring on the urban fringe of metropolitan Vancouver. Though sprawl is evident elsewhere in Canada it is believed that in the Lower Mainland it constitutes a more important portion of new development than elsewhere. After an acquaintance with Lower Mainland conditions prairie cities give an impression of compactness. They seem to rise directly out of the wheat fields with little transition between strictly agricultural and purely urban uses. The compactness of prairie cities compared with conditions in the Vancouver area is probably due in large part to the rigorous prairie winters and the difficulty of keeping roads cleared outside urban areas. Prairie centres tend to huddle together against the elements as contrasted with the langurous sprawling possible in the (generally) balmy west coast climate. Some evidence of this is offered by figures on the amount of National Housing Act (NHA) construction serviced by sanitary sewers in several Canadian cities. (Economic supply of sewers is of course impossible under conditions of low population density.[1])

The percentage of NHA homes built during the three months ending September 1955 supplied with sanitary sewers are:

Vancouver	-	15 %
Edmonton	-	100 %
Winnipeg	-	99 %
Montreal	-	86 %
Ottawa	-	72 %

(The area in all cases includes the greater metropolitan area.)

As yet, however, little detailed information is available on the nature of metropolitan expansion in other parts of Canada and only tentative comparisons can be drawn between the supply of services and the density of development. It would seem to be a fertile field for future research.

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[1] Ground conditions in the Greater Vancouver area are in general extremely poor for septic tank disposal. In the till uplands an impervious clay layer is found at about 12 to 18 inches below the surface and the absorption zone is therefore very limited. In the lowlands the land is dyked and the water table is high.

Information on the land development patterns produced by urban expansion can be of greater practical value. It has been found that in the Lower Mainland urban residential areas with a density greater than 3.5 people per acre are normally capable of paying for the municipal services they require. Sprawl areas with a density between 0.3 and 3.5 people per acre are unable to pay for the municipal services they require and instead must be subsidized to a considerable extent by the remainder of the municipality. Farm areas with a density less than 0.3 people per acre provide far more in taxes than they require in services.[1]

Knowledge of the relationship between the nature of new land development and municipal economics makes it possible to predict the consequences of various types of land development to the municipal budget and to take measures to encourage the desirable and discourage the undesirable through zoning and planning techniques.

Summary

Population growth in the Greater Vancouver metropolitan area has been rapid. The greatest growth in recent years has occurred not in the central city Vancouver, but in the suburban municipalities of the fringe. Eighty per cent of the new population growth in one of the typical fringe municipalities has occurred on lots of urban size (less than one acre). Forty-four per cent of the new urban lots were located in compact groupings (gross population density over 3.5 people per acre).

The remaining urban lots, 56 per cent of the total, were widely scattered to form sprawl conditions (density between 0.3 and 3.5 people per acre).

Sprawl is considered to be a problem of greater magnitude in coastal British Columbia than elsewhere in Canada. It makes the supply of certain municipal services such as sanitary sewers virtually impossible. Sprawl areas do not provide sufficient tax return to pay for the municipal services they receive at present.

[1] These statements are based on extensive examinations in several Lower Mainland municipalities. The details are set forth in Economic Aspects of Urban Sprawl - A Technical Report; Lower Mainland Regional Planning Board, New Westminster, B.C., 1956.

EDMONTON, ALBERTA: SOME CURRENT ASPECTS OF ITS URBAN GEOGRAPHY

William C. Wonders

University of Alberta

Edmonton, Alberta is currently enjoying and suffering "boom" conditions. Such conditions, often interspersed with periods of depression, have characterized the city's history. Much of the present general prosperity is the result of the discovery of oil in February, 1947 at Leduc, 20 miles south of Edmonton. There has been no decline in the accelerated activity of oil companies since. "Expenditures by the petroleum industry in Western Canada are now on the order of $450,000,000 per annum .... It has been estimated that $1.5 billion has been expended since 1946 in Western Canada for exploration and development of petroleum, with a further billion dollars spent in Canada on refineries and pipeline construction and extension".[1] Most of the activity in Western Canada has been concentrated in Alberta, where prior to 1947 there was only one major oil field and an average daily crude oil production rate of less than 20,000 barrels.[2] Today there are over 30 producing fields or pools in the province, with a daily production rate of over 350,000 barrels and a potential daily production rate of over 580,000 barrels. Whereas only 20 drilling rigs were active in the province at the time of the Leduc discovery, there were 189 operating in January, 1956. In 1955 alone there were about 1,600 well completions in Alberta, almost as many as in 1951 and 1952 combined. Current production is from over 6,200 wells, about 6,000 of which have been drilled since 1947. The provincial government estimates "that the approximate increase in production in 1980 over 1955 rates will be 3.5 times for crude oil, 14 times for natural gas and 15 times for natural gas liquids ... (all of which) will require considerable capital expenditure for exploration, the drilling of some 40,000 to 50,000 wells, and the construction of additional pipeline facilities and new refinery capacity".[3,4]

In this continuing expansion of the petroleum industry Edmonton is occupying a dominant position. The three new major oil fields established in Western Canada all lie within an 80-mile radius of the city - Leduc-Woodbend 15 miles south-west, Redwater 45 miles north-east, and Pembina 75 miles west. The latter field, discovered only in 1953 and still undefined to the west, passed Redwater as Canada's top producer in early 1956. Some authorities believe it may prove to be the largest oil pool in the western hemisphere. Edmonton thus has been established as the centre of Albertan and Canadian oil production. By mid-1954 there were over 3,000 producing oil wells within a 50-mile radius of the city and it was claiming the title of "Oil Capital of Canada". (Figure 1).

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[1] Western Canadian Oils (1956 version); James Richardson & Sons, Winnipeg, 1956, p.48.

[2] Alberta Dept. of Econ. Affairs, Alberta's Economic Prospects; Queen's Printer, Edmonton, 1956, p.111.

[3] Ibid., p.121.

[4] For a comprehensive survey of the economic significance of the petroleum industry on the provincial level see "The Impact of the Developing Petroleum Industry on the Alberta Economy" by W.D. Gainer, Dept. of Pol. Economy, Univ. of Alberta, a paper (n.p.) presented to the Science Association, Univ. of Alberta, February 18, 1954.

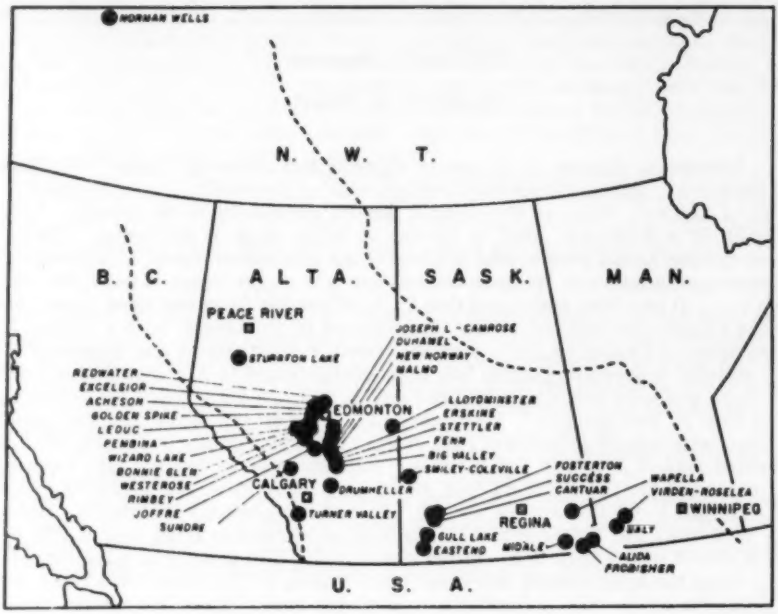

Figure 1. Important oilfields in Western Canada, 1955.

Among the resultant significant developments in the urban geography of Edmonton have been: 1) the changing aspect of its industry, 2) the rapid increase in its population, 3) the city expansion and practical application of urban and district planning concepts, and 4) the crisis in municipal government primarily in financing the greatly expanded service facilities necessary. Each of these will be considered in turn.

Industry

Functionally, Edmonton reflects the importance of its geographic position. (Figure 2). Its initial selection as provincial capital was based largely on its central location in Alberta and from this has stemmed its role as political and educational centre. Situated in the heart of the province's crescent of rich, black soil, the city has developed as a service centre for a productive mixed-farming district. Also because of its advantageous geographic position the city has become a major rail, air, and road centre. Finally, its strategic location, first appreciated during World War Two and emphasized by subsequent critical international conditions, has made Edmonton one of Canada's principal military centres.[1]

[1] See Wonders, William C.: Repercussions of War and Oil on Edmonton, Alberta, a paper presented to the Assoc. of Amer. Geographers, Montreal, April, 1956.

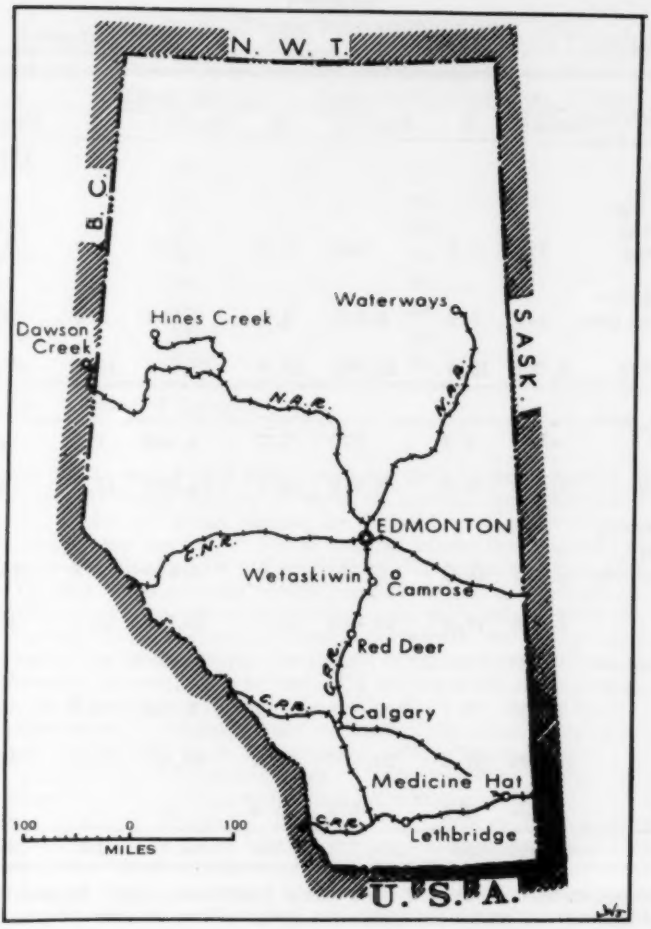

Figure 2. General location of Edmonton, Alberta.

Mainly then, the city has been a distributing and shipping centre, which also provides the many government and other services required by its hinterland, in agriculture, northern developments, and more recently oil exploration. (Table I). In 1946 37.3 per cent of its labour force was engaged in service industry, 19.0 per cent in trade, only 15.9 per cent in manufacturing, and 11.2 per cent in transportation. Following the Leduc discovery there was much acceleration of business generally in

TABLE I

Labour Force, Edmonton, 1946, 1951, 1955, 1980 (Estimated)

Industry	1946 Number	%	1951 Number	%	1955 Number	%	1980 Number (Estimated)	%
Agriculture, forestry, logging, fishing and trapping	615	1.3	686	1.0	700	0.7	1,000	0.6
Mining, quarrying, oil and gas	442	0.9	2,012	3.0	3,300	3.4	3,500	2.1
Manufacturing	7,364	15.9	10,061	15.0	18,500	19.2	40,000	24.0
Electricity, gas and water	535	1.2	875	1.0	1,100	1.1	2,000	1.2
Construction	3,740	8.1	8,073	11.9	11,500	11.9	12,000	7.2
Transportation, storage and communication	5,175	11.2	6,990	10.4	8,500	8.8	15,000	9.0
Trade	8,773	19.0	14,640	21.7	20,000	20.7	36,000	21.6
Finance, insurance and real estate	1,526	3.3	2,675	4.0	3,000	3.1	5,000	3.0
Service	17,234	37.3	21,097	31.2	30,000	31.1	52,000	31.3
Not stated	836	1.8	572	0.8	---	---	---	---
Total	46,240	100	67,711	100	96,600	100	166,500	100

Source: Compiled from Census of the Prairie Provinces, 1946, Census of Canada, 1951, city estimates for 1955, and Brief of City of Edmonton to Gordon Commission, November, 1955.

the city. New elements were added to the city's industry, such as oil drilling firms, geophysical companies, oil supply houses, oil pipeline terminal, and three oil refineries, but by 1951 the basic industrial pattern in terms of labour force had not changed significantly. The slight decrease in the relative importance of service (to 31.2 per cent) was accounted for by a corresponding increase in construction and those engaged in oil and gas work.

Comparing the major metropolitan cities of Canada in 1951, the latest year for which comparable figures are available, the relatively minor role of manufacturing in Edmonton in terms of labour force can be noted. (Table II). Much of the major manufacturing developments however has been since 1951. The oil refineries have been

TABLE II

Labour Force, Census Metropolitan Areas, 1951

Metropolitan Area	Manufacturing	Trade, Transport & Communications	Finance & Services (including government and defence)
Edmonton	17	33	33
Calgary	15	32	34
Winnipeg	25	36	29
Vancouver	25	32	30
Toronto	36	26	27
Montreal	38	26	27
Hamilton	52	19	19
Windsor	52	20	19

Source: Census of Canada.

expanded until by the end of 1955 their combined daily capacity was 43,000 barrels, including the largest single refinery in Western Canada. Yet Edmonton ranks as fourth refining centre in Canada, falling far behind first-place Montreal with its 230,000 barrels-a-day capacity.[1] Since 1951 petroleum by-products have attracted two major petro-chemical plants and made Edmonton second only to Sarnia, Ontario as a centre for that manufacturing industry in Canada. A $70 million plant employs more than 600 persons and integrates three phases of manufacture in one location: the petro-chemical division produces organic chemicals; the acetate division makes cellulose acetate, the base material for textile yarns; and the yarn division manufactures the fibres for fabrics. The second, $15 million plant employing approximately 250 persons, is Canada's first polythene production unit. It was largely these manufacturing plants which accounted for the increase of the manufacturing labour force from 15.0 per cent in 1951 to 19.2 per cent in 1955. (Table I).

Since labour may be misleading as an indicator of the relative importance of some manufacturing industries, particularly oil refining, gross value of production has been given in Tables III and IV, 1954 being the latest year for which statistics are available. The most striking feature of change between 1948 and 1954 is the relative decline of the "foods and beverages" industries from 78.8 per cent of the total value of production to 46.2 per cent. On the other hand, "products of petroleum and coal" increased from 0 per cent to 23.4 per cent and "chemical and allied products" from 0.5 per cent to 5.7 per cent. (In addition, the output of petro-chemical yarns is shown in a separate category.) Gross value of production of leading individual manufacturing industries (Table IV) points up the dominance of slaughtering and meat packing with 33.6 per cent in 1954, followed by refining with 23.7 per cent, chemical and allied products 5.4 per cent, and dairy products 4.6 per cent.

The city is anticipating further increase in the relative importance of local manufacturing, forecasting that it will constitute 24 per cent of the labour force by 1980 (Table I), based upon developments in primary and secondary industry. Among

[1] Western Canadian Oils, op. cit., p.56.

TABLE III

Gross Value of Production, Edmonton Manufacturing Industries, 1948 and 1954

Manufacturing Industry	1948 Gross Value of Production (millions of dollars)	%	1954 Gross Value of Production (millions of dollars)	%
Foods and beverages	95.9	78.8	117.5	46.2
Textile products (except clothing)	0.3	0.3	2.4	1.0
Clothing (textile and fur)	4.9	4.0	6.4	2.5
Wood products	5.9	4.9	9.0	4.0
Paper products	--	--	2.2	0.9
Printing, publishing, etc.	3.8	3.1	7.9	3.1
Iron and steel products	4.4	3.6	16.4	6.5
Transportation equipment	--	--	9.8	4.0
Electrical apparatus and supplies	--	--	0.1	--
Non-metallic mineral products	1.5	1.3	5.7	2.3
Products of petroleum and coal	--	--	59.6	23.4
Chemical and allied products	0.6	0.5	14.4	5.7
Other industries	4.2*	3.5	0.9	0.4
Total Gross Value	121.6	100.0	252.3	100.0
Total Net Value	88.0		121.0	

* Largely transportation equipment but not separated out because only one employer involved.

Source: Compiled from D.B.S. statistics.

new multi-million dollar manufacturing plants currently under construction or completed in the past few months are: an electric furnace and steel rolling mill, steel pipe mills, cement plants, and a plywood plant. Major assets in attracting additional manufacturing industry are abundant petroleum and natural gas for raw materials and cheap fuel, and the increasing local market demand. To what extent these can offset distance from the major Canadian markets is the chief problem.

TABLE IV

Major Manufacturing Industries, Greater Edmonton, 1954

Manufacturing Industry	Gross Value of Production (millions of dollars)	%
Slaughtering and meat packing	84.7	33.6
Refining	59.6	23.7
Chemical and allied products (plastic, etc.)	13.6	5.4
Dairy products	11.7	4.6
Wood using	7.2	2.9
Bread and bakeries	7.0	2.8
Clothing (men's)	5.7	2.3
Cement products	5.3	2.1
Others	57.2	22.6
Total	252.0	100.0

Source: Compiled from D.B.S. statistics.

Population

In 1956 Edmonton is a city of over 223,000 while the metropolitan area [1] now exceeds 245,000. The rate of population increase placed that city first among all census metropolitan areas in Canada between 1941 and 1951 - an amazing 76.9 per cent, as compared with second-ranking Calgary with 49.5 per cent and Vancouver's third place 40.6 per cent. During the same period of time the Toronto metropolitan area increased its population by 22.8 per cent to rank tenth, and Montreal 21.8 per cent to rank twelfth. A provincial royal commission reports, "All the signs point to the fact that these areas (Edmonton and Calgary) are still the fastest growing metropolitan areas in the country in 1955". [2] Some enthusiasts claim for it the title of 'fastest growing city on the continent'. Such superlatives are often of questionable value, yet the rapidity of recent growth is a marked characteristic of Edmonton.

Although the rate was not as spectacular as during the height of its wartime boom, Edmonton's population was increasing appreciably in the immediate post-war years. In 1946 and 1947 the increase was approximately 3 per cent. Following the discovery of the Leduc oil field, however, the population increased by over 8,000 or 6.4 per cent from 1947 to 1948. Since then the average annual increase has been over 12,000, with over 14,000 population added in both 1953 and 1954, that figure in the former year representing an 8.4 per cent increase. In 1955 the increase dropped to 11,517 or only a 5.8 per cent increase and there was considerable speculation whether this represented the start of the "levelling-off" of population growth. The 1956 figure again climbed beyond 14,000, however, representing a 7.1 per cent increase.

[1] Including the City of Edmonton, the towns of Jasper Place and Beverly, and part of the Municipal District of Strathcona.

[2] Statistics and quotations from Report of the Royal Commission on the Metropolitan Development of Calgary and Edmonton, Queen's Printer, Edmonton, 1956, (The "McNally Commission Report") Ch.2, p.4.

Future population of Edmonton is almost impossible to forecast. "Nearly all estimates since the war have underestimated the growth that has actually occurred. The City of Edmonton estimates in 1948 for the period 1949 to 1953 'proved almost as inadequate as the amount of money that was estimated to be required'. The city estimate for 1953 was 165,000 but the actual figure turned out to be 183,411. An estimate prepared for the Chamber of Commerce in 1951, four years after the first Leduc discovery, put Edmonton's 1961 population at 211,000".[1] Yet by 1956 the population already has passed 223,000. In 1955 the city authorities stated, "In looking ahead for 20 to 25 years .... one must foresee for this area a population close to 400,000 ..."[2]

Table V shows the important break which occurred in 1948 as regards means of population increase. Previous to that date natural increase was the major factor in city growth of recent years (except for the war year 1943). But since 1947, well over

TABLE V

Population Growth for the City of Edmonton

Year	Population	Increase Over Previous Year	% Increase	Natural Increase	Immigration	%
1946	114,976	3,231	2.9	2,283	948	29.3
1947	118,541	3,565	3.1	2,920	645	18.1
1948	126,609	8,068	6.4	2,935	5,133	63.6
1949	137,469	10,860	7.9	3,282	7,578	70.0
1950	148,861	11,392	7.7	3,481	7,911	69.4
1951	158,912	10,051	7.8	3,922	6,129	61.0
1952	169,196	10,284	6.4	4,482	5,802	56.4
1953	183,411	14,215	8.4	5,077	9,138	64.3
1954	197,836	14,425	7.9	5,730	8,695	60.1
1955	209,353	11,517	5.8	5,758	5,759	50.0
1956	223,549	14,196	7.1	7,098	7,098	50.0

Source: City of Edmonton Brief to Federal Royal Commission on Canada's Economic Prospects, Nov. 15, 1955 and 1956 Civic Census.

half the population increase has been due to immigration. In the seven post-Leduc years the natural increase averaged over 4,000 a year, but the net immigration averaged over 7,000 annually.[3] In the last two years the increase, significantly has been due about equally to immigration and natural increase. The youthfulness of the city's population as compared with other large Canadian cities is significant with 27 per cent of the population 14 years and under and 36 per cent 15 to 36 years of age. (Table VI).

The source of this major influx of population with respect to birthplace is also significant. Because most of the petroleum companies and petroleum industry service companies are controlled, directly or indirectly from the United States, it is some-

[1] McNally Commission Report, Ch. 2, p. 20.

[2] City of Edmonton, Brief to the Royal Commission on Canada's Economic Prospects, p. 8.

[3] McNally Commission Report, Ch. 2, p. 11.

TABLE VI

Percentages of Population in Different Age Groups, 1951

Age	Edmonton	Edmonton Metropolitan Area	Average of Large Canadian Cities (over 100,000 population)
0-14	26.8	27.6	23.3
15-34	35.6	35.4	32.7
35-64	30.7	30.3	35.8
over 65	6.9	6.7	8.5

Source: Compiled from Census of Canada, 1951.

times assumed that much of this immigration has been from that country. It is often true that "key personnel" in such local industry are American, and that services of specialist American oil field workers are called on in an emergency (e.g., to extinguish a burning "wild" oil well). However, Table VII shows that there has been no

TABLE VII

Birthplace of Population of Edmonton

Birthplace	Percentage of Population 1946	1951
Maritime Provinces	1.8	1.8
Quebec	1.5	1.5
Ontario	7.5	6.4
Manitoba	3.2	3.5
Saskatchewan	5.2	6.8
Alberta	51.5	52.8
British Columbia	1.5	2.0
Yukon and N.W.T.	0.8	0.2
Canada	73.0	75.0
United Kingdom	13.9	10.4
Other Europe	8.3	9.9
U.S.A.	4.5	4.2
Asia	0.3	0.5
	100.0	100.0

Source: Compiled from Census of the Prairie Provinces, 1946 and Census of Canada, 1951.

significant change in the composition of the city's population as to birthplace following the recent rapid petroleum development. In 1951, 75.0 per cent of the population was born in Canada (over half in Alberta) and only 4.2 per cent in the U.S.A. as compared with 73.0 per cent and 4.5 per cent respectively in 1946.

City Expansion

This great development in industry and population has resulted in an unprecedented burst of construction and city expansion. In 1946, free from wartime restrictions, the city established a new construction record with 3,661 building permits issued, to a value of over $15 million. (The previous record was set during the 1912 boom.) A drop occurred in 1947, but since the Leduc discovery there has been even greater activity annually, with increasing numbers of building permits issued. Furthermore, each year the value of these always has more than doubled the 1946 figure. (Table VIII). The latest record was established in 1954 with 7,700 permits issued to a value of over $68 million. Following a slight drop in 1955, a new record is being forecast for 1956.

TABLE VIII

Building Permits and Bank Clearings, Edmonton

Year	Number	Value	Bank Clearings
		(millions of dollars)	(millions of dollars)
1925	509	1.5	239.4
1930	2,056	4.3	293.6
1935	651	0.7	199.4
1940	1,442	2.6	218.0
1945	3,161	8.0	519.3
1946	3,661	15.0	635.2
1947	2,805	13.2	699.5
1948	4,079	27.1	866.7
1949	5,792	40.1	1,020.5
1950	5,785	46.6	1,205.3
1951	5,343	36.4	1,332.2
1952	5,967	37.1	1,620.5
1953	7,085	55.0	1,807.4
1954	7,700	68.3	1,815.9
1955	7,437	58.7	2,022.0

Source: City of Edmonton and Alberta Bureau of Statistics.

House-building has been particularly noteworthy. Though Edmonton's population represents only about one and one-third per cent of the national total, 4 per cent of all houses constructed in Canada from 1947 to 1954 were built in the city.[1] The President of the National House Builders' Association reported the rate of new housing starts in Canadian metropolitan areas in 1954 averaged 14 per 1,000 people. Edmonton topped the list with a starting rate of 23, (Toronto had 16, and Montreal 14). The bulk of these have been of stucco construction which with frame in the case of many of the city's older houses, forms the characteristic finishing material for Edmonton's residential areas.

[1] Mayor W. Hawrelak, City of Edmonton, in Edmonton Journal, Dec. 31, 1955.

Despite this outstanding and continuing activity in house building, there is still a shortage in the city. This is the result not only of the abnormally rapid growth of population since 1947, but also of the fact that a local housing shortage already existed during the previous 15 years. Essentially this was due to the restricted house building activity of the Depression and World War II years. Thus building supply firms, construction companies, and real estate companies have enjoyed great prosperity, with no appreciable slackening of demand yet in sight.

In its expansion, Edmonton has profited from some of its earlier misfortune. Areally, the city sprawls over 27,000 acres or 43 square miles, so that space always has been one of its cheapest assets. It also helps explain the relatively few tall buildings in the C.B.D. where the usual cost limitations on horizontal expansion have not been as pressing as in many North American cities. Furthermore, much of the city's area was vacant or farm land until very recently. Controlled development also has been possible because much of this land has been city-owned. Of the 110,000 lots in Edmonton, title to 75,000 had returned to the city at tax sales during the Depression years. Room for expansion on civic-owned land has been a great advantage to the city in its current development.

Site characteristics have placed some restrictions on this expansion. The city is situated on a level till plain which has been modified over much of its area by lacustrine deposits. The predominantly clay subsoil is only poor to medium in its foundation value. Beyond the city proper the plain is gently rolling with a major recessional moraine forming a much more hilly area just beyond the city's eastern limits. Cutting across the city from southwest to northeast, the North Saskatchewan River divides Edmonton so that roughly two-thirds of the urban area is on the north side. The twisting, 200-feet deep, one-half to one mile-wide valley is at once Edmonton's major physical attraction and the major bottleneck for cross-city traffic. Five bridges, one of which was opened only in 1955, are still not sufficient to eliminate constriction and delay at rush-hours. The river, averaging 200 to 300 yards in width, meanders prominently, exhibiting the characteristic alternation of undercut bluffs and slip-off slopes of early maturity on the valley floor. Slumping of the undercut bluffs occurs from time to time but rarely affects building since most of the banks are park land. The river fluctuates greatly in its seasonal volume. Flooding has occurred in the city's history but the last serious flood was in 1915.

Several tributary ravines occupied by intermittant streams partially subdivide the upland surface. In the course of urban growth some small kettle ponds and relic lakes have been drained and built on especially on the "South Side", only to have several feet of water accumulate again after unusually heavy rain. Some parts of the "North Side" have suffered from temporary flooding in heavy spring run-off from the low watershed to the northwest of the city, but both problems are being solved by installation of larger storm sewers.

Fortunately, during this period of great expansion Edmonton has had available the services of qualified town and regional planners. The legal authority for planning in the province was the Town and Rural Planning Act of 1942, which has been amended several times since. In Edmonton, however, there had been even earlier attempts at urban planning with a zoning by-law brought into force in 1933, and an advisory town planning commission created as early as 1929. The director of that commission in the introduction to his first annual report[1] pointed out that Alberta had been one of the first provinces to pass a town planning act, in 1913 and that though no use was ever made of it, Edmonton (and Calgary) evidently had some tentative plans prepared at that time.

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[1] Seymour, H. L.: First Annual Report of the Director of Town Planning for the Year 1929; King's Printer, Edmonton, 1930.

The city appointed a town planner and established a planning department in 1949. A year later an Edmonton District Planning Commission,[1] the first district planning commission in the province, was established also with a professionally qualified technical staff. In the subsequent years the decisions of the city planning office have been effected in the main, despite some strenuous opposition. Much excellent work has been done on the district or regional level but to date this body has been hampered by the fact that it is a voluntary organization including representatives of 16 different municipalities and the provincial government. These may withdraw at will and there is no present means of enforcing commission recommendations, though this may be remedied as a result of the recent McNally Royal Commission. Until then it can operate only as an advisory body, unlike the city body.[2]

When the city planner began his work he inherited many of the traditional problems of the North American, or at least western cities - gridiron street patterns, concentration of downtown buildings (though mainly only one or two storeys), ribbon commercial development along main streets, etc. Some ills had been aggravated by the World War II years[3] - violation of single family housing zones, unwisely located industrial pockets, degeneration of temporary housing in some instances into slum conditions, development of "dormitory" suburbs in Jasper Place to the west and Beverly to the east, much of which was substandard building. However, old problems have been reduced and eliminated, and the great expansion of building over the previously unused city area has been guided carefully.[4] Industry has been relocated and decentralized into distinct zones according to type, undesirable railway lines have been removed where possible, business areas have been integrated to avoid further haphazard growth, to mention only a few developments. Most disturbing to the supporters of the old grid street system so hallowed in western Canada have been the curving streets of "neighbourhood residential units" housing 3,000 to 4,000 people in semi-self sufficient areas one-half to one mile across. Currently the cross-river traffic problem is being vigorously attacked, with additional bridges authorized.

The net result of all this is that today probably no other city of comparable size on the continent shows the applied results of planning on such a wide scale. Edmonton in theory is committed to the concept of an eventual "optimum size" of 350,000 to 400,000, after which satellite towns will be established. Yet even now problems have arisen in the city's expansion - sewage disposal and vacant land to mention but two. Complaints have been lodged by such downstream centres as Fort Saskatchewan and even Prince Albert because of the disposal of improperly treated Edmonton sewage. L. Gertler[5] has pointed out that the current $6 million civic investment for major extension of its sewage treatment facilities is but one of the extra

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[1] Essentially the area included is that within a 50-mile radius of Edmonton.

[2] See Gertler, L.: "The Scope of Regional Planning in the Edmonton Planning District"; Community Planning News, 3, 1955, pp.7-8.

[3] See Wonders, William C.: op. cit.

[4] See Dant, N.: "Edmonton: Practical Results of Planning Measures Since 1950"; Community Planning Review, IV, 1954, pp.31-40.

[5] Gertler, L.: "Why Control the Growth of Cities"; Community Planning Review, V, 1955, pp.151-154.

costs of increasing size (the system used for the past 25 years could serve properly only a city of up to 220,000 population). Edmonton also faces the prospect of running out of undeveloped lots for building medium-class homes in about another year's time, so that its former great asset of space is reaching an end. What will happen when this occurs, and what will be the actual decisions once the city reaches its "optimum size" remain to be seen.

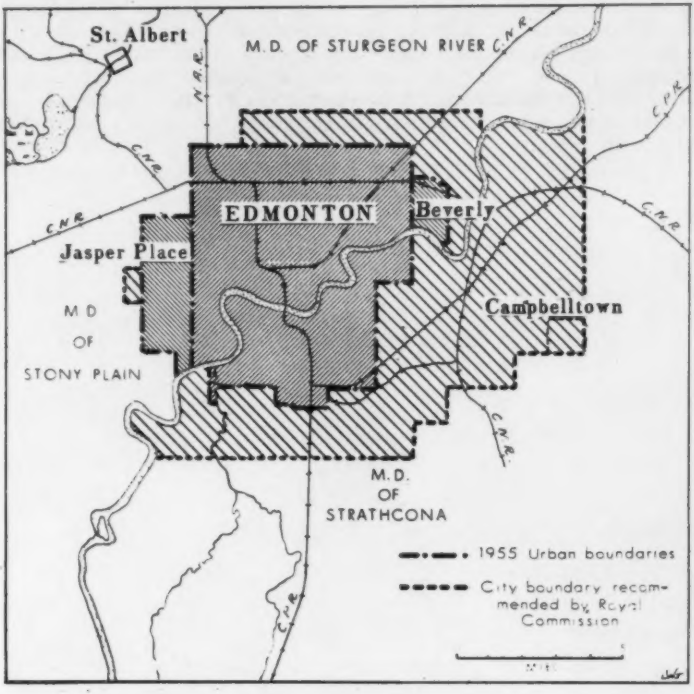

Figure 3. The Edmonton Metropolitan area.

The Municipal Crisis (Figure 3).

The current oil boom has brought municipal problems to the Edmonton area as well as industry, people, and general prosperity. In addition to those mentioned briefly in the previous paragraph there is the immediate and underlying problem of financing necessary urban services.

Most of the major new industry because of its physical requirements and nature, has had to locate to the east of the built-up area outside the civic boundaries. It needed huge amounts of land and large volume of water and hence had to be downstream from the city water intake system. The noxious fumes in some cases also relegated it to the east of the city because of the prevailing westerly winds. Thus much of the new industry, which might be expected to contribute appreciably to cost of city services, has located in the Municipal District of Strathcona, while the people have located in the City of Edmonton, and to a lesser degree in the towns of Jasper

Place and Beverly. The cost of providing services and school facilities for this population (and the youthfulness of this population should be kept in mind), has skyrocketed civic debt to the point where it now exceeds that of the province.

In order to provide a more balanced tax base the city advocated amalgamation of the metropolitan area, supported by the two suburbs and opposed by Strathcona. Controversy over the establishment of a privately financed "satellite town" (Campbelltown) only five miles east of the city limits caused the provincial government to appoint a Royal Commission to investigate the entire problem of metropolitan development of Edmonton and Calgary. Its recommendation, released in February 1956, included the amalgamation of Edmonton "at the earliest possible date" with its suburbs, including Jasper Place, Beverly, and the industrial area to the east in the Municipal District of Strathcona. If effected, the city will be enlarged more than two and one-half times its present size to 112 square miles, making it the largest in Canada.[1]

[1] The metropolitan area of Toronto covers 220 square miles, the city proper 35 square miles.

TYPES DE MAISONS DANS LA REGION SUBURBAINE DE MONTREAL

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Tout en cartographiant les caractéristiques physiques urbaines de la région métropolitaine de Montréal au cours des étés de 1953 et 1954, une équipe de la division de la Géographie du ministère des Mines et Relevés techniques en profita pour relever et cartographier également les principaux types de maisons dans la zone construite de façon continue et contigue, c'est-à-dire la zone suburbaine.

La zone construite comprend ici, en plus de la cité de Montréal, sur l'île du même nom, les municipalités d'Outremont, de Westmount, Hampstead, Verdun, Montréal-Ouest, Ville Saint-Pierre, Ville La Salle, Lachine, Saint-Laurent, Côte-Saint-Luc, Ville St-Michel et Montréal-Nord. Sur la rive droite ou sud, les municipalités étudiées sont Longueuil, Saint-Lambert, Préville, Montréal-Sud, Mackayville, Le Moyne, Greenfield Park et Jacques-Cartier.

Méthode de travail

Le territoire fut divisé en cinquante-six unités, c'est-à-dire les vingt municipalités satellites et les trente-six quartiers de Montréal. Un inventaire de cartes de base limita le choix à un groupe de cinq cartes: 1o les cartes du cadastre à cinquante pieds au pouce de la ville de Montréal, 2o les cartes et plans du service d'Urbanisme de la ville de Montréal, 3o les plans détaillés de la Commission Hydro-électrique de la province de Québec, 4o les plans des diverses municipalités, et 5e les photographies aériennes de l'ensemble. L'utilisation de ces documents nous a permis de distinguer entre les rangées compactes de maisons, les maisons à appartements, les maisons seules ou isolées et toute autre forme extérieure des résidences. Un examen minutieux des numéros de rues et des raccordements d'électricité en certain cas révélait le nombre de logements par maison ou le nombre d'étages. La partie la plus importante de l'enquête fut le relevé final sur le terrain, rue par rue, bloc par bloc. Lorsque les cinquante-six unités furent cartographiées et vérifiées, les résultats furent recopiés sur une carte de base de la région suburbaine à l'échelle de mille pieds au pouce.

Dans certains cas, la description des types de maisons est à l'unité près, dans les quartiers densément construits, la moyenne du bloc construit l'emporte. L'image que nous présentons dans la figure I est une synthèse de la carte à mille pieds au pouce. Huit groupes de maisons ont été identifiés et séparés.

Les résultats cartographiques

Groupe I. Il saute aux yeux que Montréal est une ville de maisons de brique construites en série, de deux ou trois étages. Dans certains quartiers la façade est en pierre, mais les autres murs sont en brique et la carcasse en bois; bien souvent la façade est ornée de longs escaliers extérieurs qui partent du deuxième et même du troisième étage, ce qui demande aux occupants du haut, l'agilité d'acrobates en hiver pour sortier ou entrer de leur logement. La masse des maisons en série est située au nord-est du Mont-Royal, un obstacle physique, visible de partout, qui sépare la ville et la région en deux grandes parties que les montréalais, avec leur sens particulier de la géographie, appellent l'"Est" et l'"Ouest". L'Est est effectivement le nord-est et l'Ouest le sud-ouest.

Groupe II. L'autre zone de maisons en série de deux et rois étages est située au sud-est de la montagne et comprend les vieux quartiers de Saint-Henri, Ste-Cunégonde et Pointe St-Charles, une grande partie de Verdun et la partie inférieure de

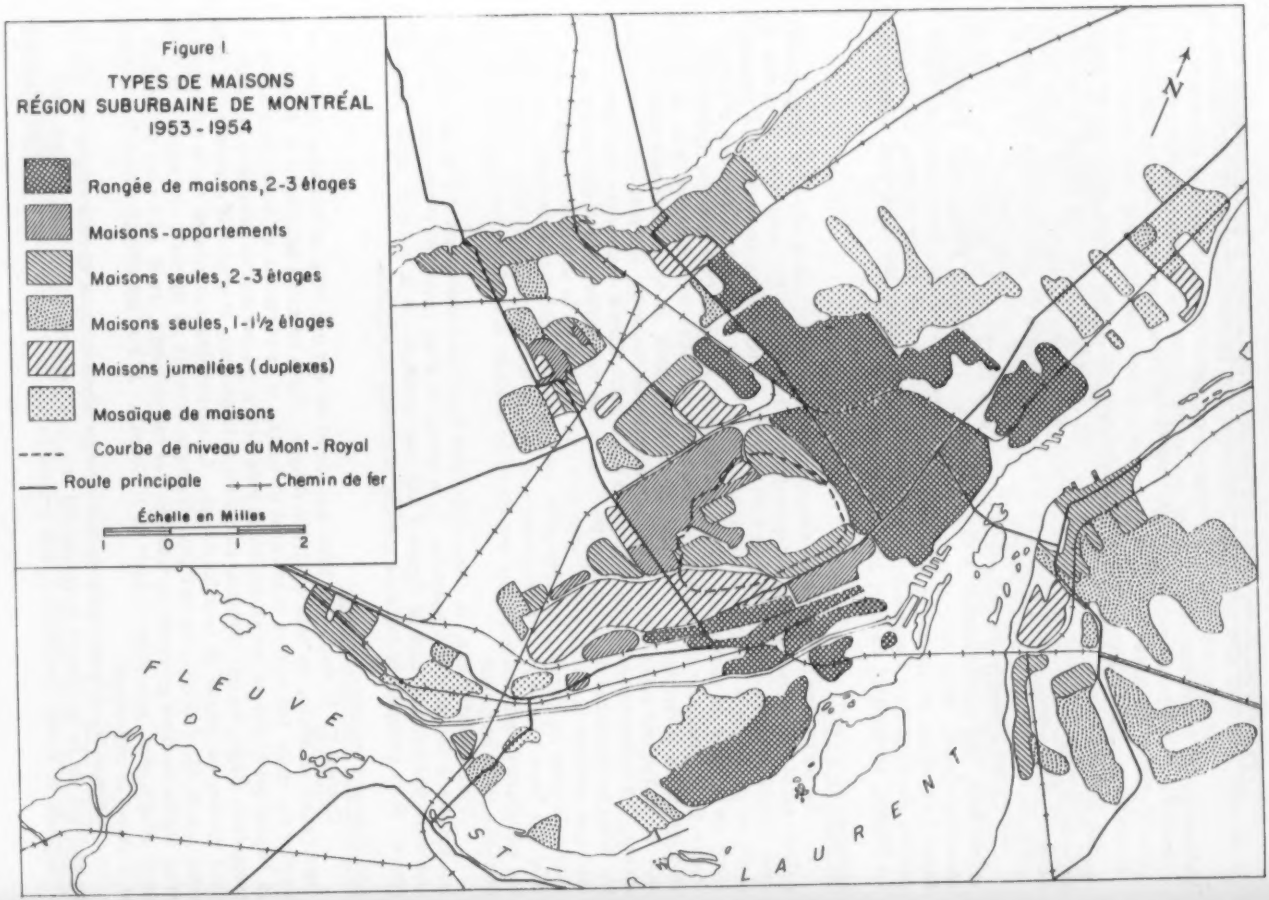
Figure I
TYPES DE MAISONS
RÉGION SUBURBAINE DE MONTRÉAL
1953 - 1954
Rangée de maisons, 2-3 étages
Maisons - appartements
Maisons seules, 2-3 étages
Maisons seules, 1-1½ étages
Maisons jumellées (duplexes)
Mosaïque de maisons
Courbe de niveau du Mont - Royal
Route principale
Chemin de fer
Échelle en Milles
1 0 1 2
N
FLEUVE
ST-LAURENT

Westmount et du quartier Notre-Dame-de-Grâce.

Groupe III. Les maisons à appartements sont disséminées dans à peu près tous les coins de la région, mais ils sont quand même concentrées dans deux quartiers de la ville, en particulier autour du centre commercial de la métropole délimité par le quadrilatère des rues Sherbrooke-Atwater, Bleury et les voies ferrées du Pacifique Canadien, et le quartier Côte-des-Neiges-Snowdon. Ces deux quartiers sont situés de part et d'autre du Mont-Royal. Signalons d'autres groupes de maisons à appartements près de l'intersection Sherbrooke-Cavendish, près de la gare de Montréal-Ouest (Westhaven Village), le long du chemin de la Côte-Saint-Luc, et à Saint-Laurent (le projet Northgate). Les maisons les plus élevées sont celles du centre de la ville, ailleurs la moyenne est de quatre étages. La brique est utilisée comme matériau de construction à l'extérieur.

Groupe IV. Les maisons seules, isolées, de deux et trois étages sont également un peu partout; elles sont concentrées toutefois dans certains quartiers. La zone située tout autour du Mont-Royal près de la courbe de niveau de trois cents pieds groupe les plus belles maisons de Montréal, du moins les plus spacieuses, les plus solides; la pierre plus que la brique est utilisée à l'extérieur.

A coté de petits hôtels particuliers on y trouve des maisons bien simples et de tous les goûts. Cette zone inclut une grande partie des municipalités indépendantes de Westmount et d'Outremont.

Groupe V. A l'ouest du Mont-Royal, deux autres zones de maisons isolées, bien construites, en pierre surtout, sont situées dans deux municipalités indépendantes, Hampstead et Ville Mont-Royal. Ailleurs, ce type de maison identifie un peuplement ancien, de grandes et vieilles maisons de pierre, de brique et de bois. Tel est le cas, dans Montréal, de la ligne de maisons en bordure de la rivière des Prairies, au coeur de Saint-Laurent, de Ville LaSalle et sur la rive droite, de Longueuil et de Saint-Lambert. Dans Lachine et Côte-St-Luc il s'agit d'un développement récent.

Groupe VI. Ce sont deux maisons de deux étages réunies par un mur mitoyen et construites en brique. La type "Notre-Dame-de-Grâce" est l'exemple le plus représentatif. En dehors de ce quartier situé au sud-ouest, il y a des maisons jumellées à Snowdon, Outremont, Ville Mont-Royal, Saint-Laurent, Bordeaux, à Saint-Lambert sur la rive-droite, et dans le quartier Mercier au nord.

Groupe VII. Les maisons isolées et basses d'un étage et demi sont d'un type plus récent. Elles sont dans la banlieue ou la périphérie de la grande zone construite. Sur l'île de Montréal, bien des zones de ce type sont des projets d'habitations construits pendant la guerre ou depuis 1945. Les maisons sont en bois recouvertes de bardeaux d'amiante, en bois, en bois et en brique, enfin en brique seulement, si elles ont été construites après la guerre. Sur la rive droite, la maison seule et basse domine dans les municipalités de Jacques Cartier, Mackayville et Greenfield Park. L'ordre est lâche, les matériaux varient, tout s'est développé sans zonage, il y a beaucoup de taudis et de "cabanes".

Groupe VIII. La dernière catégorie de maisons, la mosaïque, groupe les quartiers et zones ou aucun type particulier ne prédomine. Ce qui frappe l'observateur ou le passant, c'est le mélange de tous les types. Les zones sont à la périphérie, et dans bien de cas, il est difficile de distinguer entre ce groupe et le précédent. Dans l'ensemble ce sont des maisons simples, pauvres quelquefois, de tous les goûts, de toutes les couleurs et de toutes les formes. Les quartiers Côte-St-Paul, Mercier et Rosemont dans Montréal sont des boursouflures. Ville St-Michel, Montréal-Nord, Ville St-Pierre, des coins de ville LaSalle et Lachine ont grandi en canalisant le trop plein de Montréal, attirant les petits propriétaires par des taxes inférieures à celles de Montréal et par un code de construction assez libéral. La présence du Mont-Royal au centre a influencé la localisation des maisons. Sur les flancs de la montagne et au sommet des buttes Westmount et Outremont sont situées

TABLEAU I

Quelques fait statistiques sur les maisons de Montréal d'après le recensement de 1951 [1]

Groupe		Population totale en 1951	Nombre de logements occupés (ménages)	Nombre de maisons seules	Nombre de maisons appartements et plein-pieds	Nombre de pièces par logement	Nombre de personnes par pièces	Nombre de logements occupés avant 1946	Nombre de logements occupés de 1946 à 1951
Groupe I		660,612	151,000	1,000	138,260	5.0	0.8	83,000	60,225
Groupe II		184,301	43,499	--	40,560	5.0	0.8	27,205	15,945
Groupe III	a)	28,242	9,192	--	8,695	3.7	0.7	3,633	5,580
	b)	53,517	15,825	200	15,470	4.8	0.7	3,010	12,745
Total ou moyenne		81,759	25,017	200	24,165	4.2	0.7	6,643	18,325
Groupe IV		50,492	13,794	1,680	10,000	7.0	0.5	6,415	7,145
Groupe V	a)	12,158	3,342	1,260	1,330	6.2	0.6	1,085	2,175
	b)	34,552	6,859	1,770	4,575	5.4	0.8	1,945	4,925
	c)	3,260	954	365	490	6.1	0.5	320	640
	d)	23,932	5,735	2,085	3,260	5.6	0.7	2,320	3,395
Total		73,902	16,890	5,480	9,655	5.8	0.6	5,670	8,130
Groupe VI		64,080	17,556	1,350	13,605	5.9	0.6	7,110	10,445
Groupe VII		36,401	7,964	5,365	2,500	4.7	0.9	1,785	6,190
Groupe VIII	a)	123,385	25,895	5,945	18,460	4.8	0.8	7,715	18,170
	b)	34,733	7,969	710	6,910	4.8	0.9	4,100	3,780
	c)	53,438	12,227	3,835	7,515	5.4	0.7	4,800	7,285
	d)	20,426	4,968	1,010	3,055	5.1	0.8	940	4,035
Total		231,982	51,059	11,500	35,940	5.0	0.8	17,555	33,270
Suburbaine		1,383,529	326,779	26,575	274,685	5.3	0.7	155,383	162,680

[1] Une bonne partie des chiffres sont tirés de l'échantillon de 20 pour cent des logements. En raison de l'échantillonnage, les chiffres de moins de 10 sont indiqués par un tiret.

les résidences les plus dispendieuses, les plus grandes et les plus hautes, à mesure qu'on descend vers la plaine et qu'on s'éloigne du centre, apparaissent des maisons de plus en plus modestes, petites et basses. On ne retrouve pas autour de la montagne, les mêmes types de maisons dans chaque cercle, par exemple, le sud-ouest et l'ouest groupent des quartiers plus neufs et plus jolis, habités d'ailleurs par la grande majorité de la population de langue anglaise de la région. Il serait intéressant de dessiner ici le profil architectural à partir de la maison seule du haut de la montagne jusqu'à la maison seule de la partie basse, le long d'une ligne droite partant de l'université de Montréal pour aboutir à la rivière des Prairies par exemple. Pour y suppléer, nous avons choisi huit photographies de types de maisons dans des groupes différents. (Figure 2)

Enfin pour savoir l'âge des maisons, nous renvoyons le lecteur à une carte du service d'urbanisme de la cité de Montréal qui s'explique par elle-même.

Les résultats statistiques [1]

Il est presque impossible de compiler des relevés statistiques qui coincideraient exactement avec les groupes de maisons déjà identifiés. Nous avons donc dressé une carte index des unités de recensement et des municipalités qui, lorsque groupés, se rapprochent des huit groupes. Cette deuxième carte permet de lire le tableau I et de faire les rapprochements nécessaires entre ce que les chiffres révèlent et ce que la première carte illustre. (Figure 3).

Le tableau I réunit donc une série de données statistiques qui complètent notre enquête sur les types de maisons dans la région métropolitaine. Les données présentées ici se rapportent aux caractéristiques physiques des maisons, soit à leur apparence extérieure, à la division intérieure, etc. Voici quelques faits qui se dégagent du tableau précédent:

a) le groupe qui a le plus grand nombre de maisons seules par rapport à sa population est le groupe VII, quatre municipalités de la rive Sud: Greenfield Park, Jacques-Cartier, Le Moyne et Mackayville, soit une maison seule par six personnes,

b) le groupe III est celui qui a le plus grand nombre de maisons appartements et plein-pieds par rapport à la population, soit une maison par trois personnes.

c) les plus grands logements et les maisons les plus spacieuses sont situées dans le groupe IV, la zone d'habitation accrochée aux flancs du Mont-Royal, avec une moyenne de sept pièces par logement,

d) par contre, les logements les plus petits sont situés dans le quartier des maisons à appartements du centre de la ville, le groupe IIIa, avec une moyenne de 3.7 pièces par logement,

e) les quartiers des maisons seules et petites est le groupe VII de la rive Sud avec des logements et maisons de 4.7 pièces par unité,

f) ce même groupe (le groupe VII) est celui où l'on trouve le plus grand nombre de personnes par pièce, soit 0.9, avec le groupe VIIIb, le quartier Côte-St-Paul-Ville-Emard de Montréal, deux groupes de fortes densités par rapport à l'espace habitable,

g) par contre, là ou il y a le plus de pièces par personnes, c'est à Hampstead (groupe Vc) et dans la zone habitée située au-dessus de la courbe de niveau de 300 pieds, soit le groupe IV, avec une moyenne de 0.5 personnes par pièce,

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[1] Neuvième recensement du Canada. Caractéristiques de la population et du logement par secteur de recensement de Montréal. Bulletin CT -3, 1953, 63 pp., et Volume III, Logements et Familles.

Rangée de maisons. (Groupe II)

Escaliers extérieurs, rangée de maisons. (Groupe I)

Rangée de maisons, rue St. Christophe. (Groupe I)

Maisons à appartements. (Groupe VIIIc)

Maisons appartements. (Groupe III b)

Duplex et maisons isolées. (Groupe IV)

Maisons isolées. (Groupe VII)

Maisons isolées. (Groupe Va)

Figure 2. Maisons de la région suburbaine de Montréal.

h) il y a plus de logements occupés depuis 1946 (soit 162,680) qu'avant cette date (155,383), la plupart des maisons qui abritent ces logements sont situés surtout de la périphérie.

En dernier lieu, le recensement donne pour la région métropolitaine des renseignements additionnels qui peuvent être fractionnés en deux grands groupes seulement: d'une part l'île de Montréal, d'autre part le comté de Chambly.

TABLEAU II

Renseignements additionnels sur les maisons de Montréal d'après le recensement de 1951

	Nombre total de logements	Principal matériel extérieur					
		Bois	Brique	Imitation de brique	Stuc	Pierre	Autre
Ile de Montréal	318,005	12,165	263,745	10,570	4,360	24,360	2,805
Comté de Chambly	17,795	3,885	4,890	6,680	480	320	1,340
Total	335,800	16,050	268,635	17,250	4,840	24,680	4,145

La brique ou le revêtement de brique à l'extérieur est utilisé dans près de 80 pour cent des logements (et le pourcentage vaut pour les maisons) de la région de Montréal.

Un élément de comparaison important manque dans cette étude, c'est la superficie en milles carrés des huit groupes qui permettrait d'évaluer la densité de l'habitat urbain, un facteur géographique indispensable à la connaissance du milieu. L'étude des caractéristiques physiques des logements et maisons n'est que l'introduction à une étude plus vaste de l'habitat urbain dans une grande région métropolitaine.

Figure 3
CARTE INDEX DES GROUPES DE MAISONS IDENTIFIÉES DANS LE RELEVÉ STATISTIQUE
(Voir appendice 1)
Groupe 1
Groupe 2
Groupe 3
Groupe 4
Groupe 5
Groupe 6
Groupe 7
Groupe 8
Échelle en Milles
0
1
2
N
1
8a
5b
8d
5a
3b
5c
6
4
3a
2
8b
8c
5d
5d
7
FLEUVE ST-LAURENT

APPENDICE I

Liste des secteurs de recensements et des banlieues par groupe
(Tels que représentées sur la figure 3.)

Groupe I. Secteurs 6-8, 55-89, 90-99, 100-143, 150-157, 161-190, 192-194, 196, 204, 217-218, 220.

Groupe II. Secteurs 9-27, 36, 40, 208-209. Verdun (244-257)

Groupe III.
a) Secteurs 1-5.
b) Secteurs 46-50, 54, 228. (Snowdon - Côte-des-Neiges)

Groupe IV. Secteurs 51-53, 205, 211-213, 215, 216, 219, 221-222. (Outremont - Westmont)

Groupe V.
a) Secteurs 223-224, 207. (Mont-Royal)
b) Secteurs 199-202. (Abruntsic)
c) Secteurs 230. (Hampstead)
d) Longueuil, St-Lambert, Montréal-Sud.

Groupe VI. Secteurs 35, 37-39, 41-45, 210, 214. (Notre-Dame-de-Grâce)

Groupe VII. Greenfield Park, Jacques-Cartier, Le Moyne, Mackayville).

Groupe VIII.
a) Secteurs 144-149, 158-160, 191, 195, 197-198, 261-263, 272. (Ville Saint-Michel, Montréal-Nord)
b) Secteurs 28-34.
c) Secteurs 229, 231-243. (Côte St-Luc Montréal-Ouest, Ville St-Pierre)
d) Secteurs 265-267. (Saint-Laurent)

DISTRIBUTION OF COMMERCIAL ESTABLISHMENTS IN ST.JOHN'S, NEWFOUNDLAND [1]

Charles N. Forward

Geographical Branch, Dept. of Mines and Technical Surveys

A systematic investigation of the distribution of commercial establishments reveals a great deal about the structure and character of a city. Certain commercial activities, such as retail and wholesale trade and services, are essential in the functioning of a modern city, and in the case of St.John's the various types of business establishments were mapped with the aim of defining significant distributional patterns and enabling further analysis of the city's commercial characteristics. These patterns are related to population distribution in an attempt to indicate potential new locations for specific types of business and points of present overcrowding. Finally, on the basis of commercial character, the city is divided into a number of discrete districts, which facilitate an understanding of the city's structure.

Urban Land Use and Population

The city of St.John's is situated on the northwest side of its excellent, landlocked harbour. Through the old section of the city the land rises steeply from the waterfront to an elevation of 200 feet before it levels off to some extent in the newer residential areas (see contours on Figure 1). The most densely built-up area is situated on this slope rising from the harbour, and here, also, is the greatest concentration of commercial establishments. Large areas within the city, of course, are occupied by government buildings, hospitals, churches, schools and other institutions, as evidenced by the land use map (see Figure 1). Commercial land use is concentrated in several main areas, but scattered establishments are found throughout the city. A zoning by-law has recently become effective which controls the future location of business premises (see Figure 2).

Population distribution is shown on Figure 3 by dots representing 50 persons each. It is based on population totals of polling divisions, as determined from the number of electors by the city Planning Office in 1953. These figures were revised in the summer of 1955 by an approximate estimate of population increase and knowledge of the location of new housing areas. The street network of St.John's is indicated on Figure 4.

Retail Establishments

Mapping of the locations of all commercial establishments, according to type of business, was carried out in 1955 by the use of available trade directories and with frequent field checks. As a result, the types of stores represented in St.John's were determined, and are listed in Table I by number of establishments and number of persons per establishment. Food and beverage stores, as would be expected, head the list, which grades down to the more specialized stores.

Grocery stores. The great majority of grocery stores are rather small and are scattered throughout the populated areas of the city (see Figure 5). The large groceries found in the waterfront business area are connected with department stores.

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[1] Based upon material gathered during field investigations carried out for the Geographical Branch, Department of Mines and Technical Surveys, Ottawa.

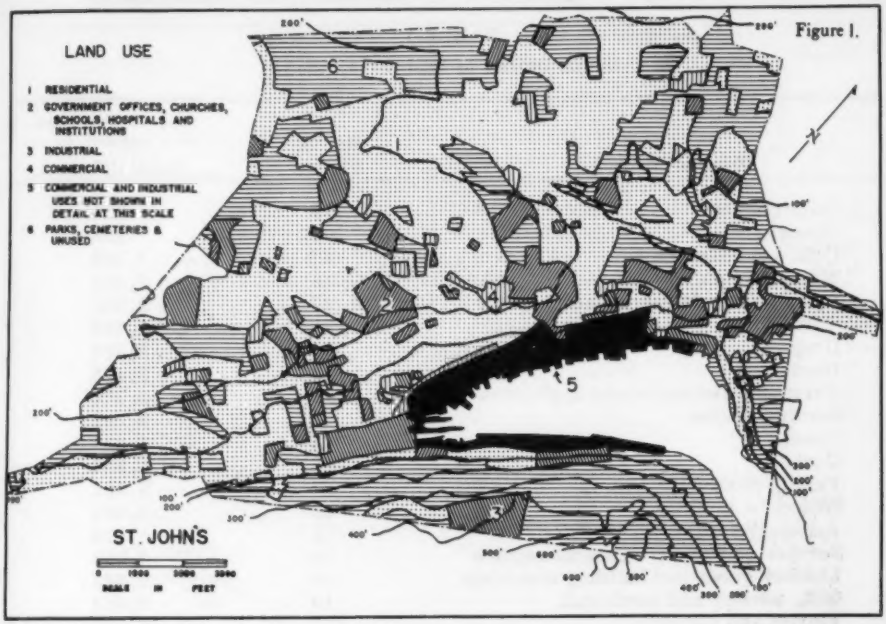
LAND USE
1 RESIDENTIAL
2 GOVERNMENT OFFICES, CHURCHES, SCHOOLS, HOSPITALS AND INSTITUTIONS
3 INDUSTRIAL
4 COMMERCIAL
5 COMMERCIAL AND INDUSTRIAL USES NOT SHOWN IN DETAIL AT THIS SCALE
6 PARKS, CEMETERIES & UNUSED
ST. JOHN'S

Figure 1.

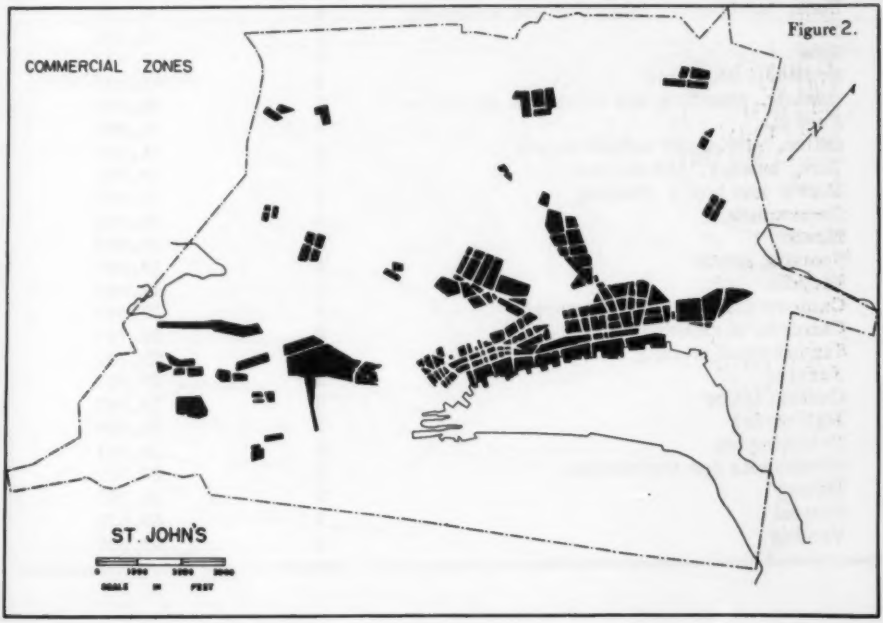

Figure 2.

TABLE I

Retail Stores in St. John's, 1955

Type of Store	No. of Stores	No. of Persons per Establishment
Confectionery	172	346
Grocery	167	356
Cafe and restaurant	43	1,384
Meat and fish	33	1,804
Dry goods and general merchandise	27	2,205
Tavern	24	2,480
Drug	24	2,480
Hardware	19	3,133
Furniture and household appliances	18	3,307
Service station	17	3,502
Jewellery	13	4,579
General	12	4,961
Family clothing	12	4,961
Women's clothing	12	4,961
Automotive sales and service	11	5,412
Service station with general repairs	10	5,953
Lumber yards and building materials	10	5,953
Gift, novelty and handicraft	10	5,953
Florist and nursery	10	5,953
Book, newspaper, magazine and stationery	9	6,615
Coal	7	8,505
Shoe	6	9,922
Fruit and vegetable	5	11,907
Heating, plumbing and electrical supply	4	14,883
Fuel oil	4	14,883
Office, store, and school supply	4	14,883
Tire, battery, and accessory	3	19,845
Men's and boy's clothing	3	19,845
Department	3	19,845
Music	3	19,845
Sporting goods	3	19,845
Bicycle	3	19,845
Camera and photographic supply	3	19,845
Children's clothing	2	29,767
Second-hand clothing	2	29,767
Furrier	2	29,767
Custom tailor	2	29,767
Mail-order	2	29,767
Delicatessen	2	29,767
Monuments and tombstones	2	29,767
Bakery	2	29,767
Optical	1	59,535
Variety	1	59,535

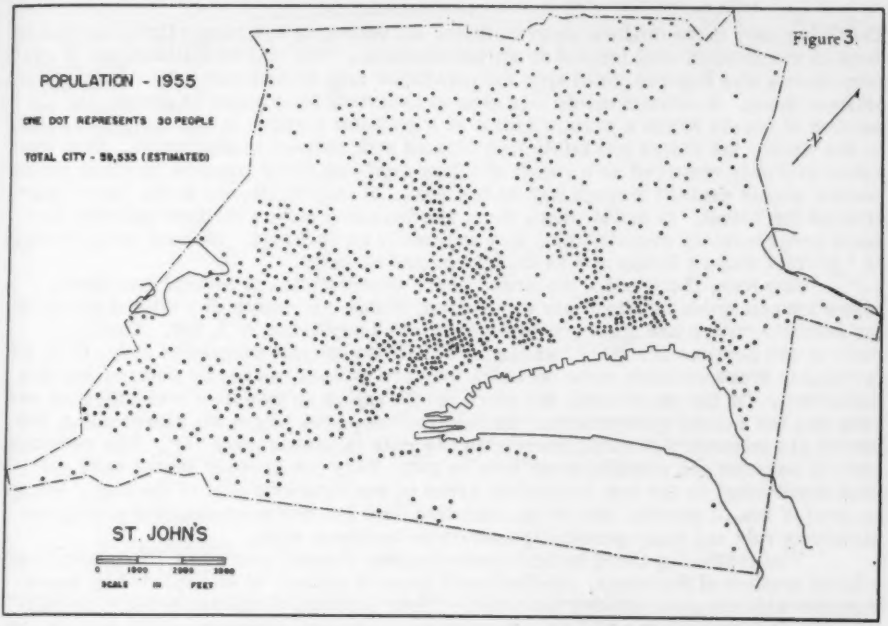

Figure 3.

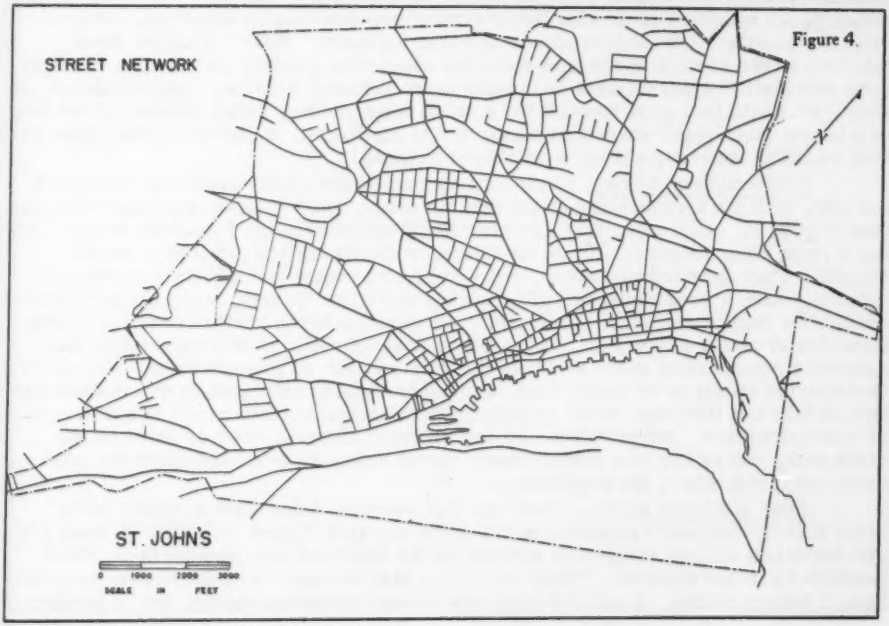

Figure 4.

There are only three modern supermarkets, all belonging to a single firm,but each of them is remarkably well located to attract business. The map of distirubition of grocery stores was superimposed upon the population map to determine the relationships between them. A counter circle was used to ascertain the number of stores and the number of people within a certain radius of significant points. It was discovered that, on the whole, the stores are fairly well located with respect to population. This situation probably occurred as a result of a long trial and error process in which unsuccessful stores expired through lack of business. It may be likened to the law of survival of the fittest. In areas where there are too many stores the less efficient become progressively shabbier until they eventually go bankrupt. Several in the vicinity of 'A' (see Figure 5) are now in the last stages of decay.

However, there are a few areas where overcrowding is evident and others where advantageous locations are unoccupied. Within one-eighth of a mile of point 'B' for example, there are eight grocery stores and a population of 1, 200. That is a ratio of 150 persons per store, or less than half the overall average of 356. Even the favourable transportation route on which they are located can hardly account for this deficiency. On the other hand, the store at 'C' enjoys an excellent site with good access and few nearby competitors. Another crowded area where six stores and 1, 000 people are concentrated within one-eighth of a mile is around point 'D'. The resulting ratio of persons per establishment here is 166. Very few grocery stores have yet been established in the new residential areas of the northwest part of the city. Being an area of future growth, this is an attractive field for new business, but zoning restrictions rule out many potentially favourable business sites.

The continuing trend toward modernization of retail trade will likely eliminate a large number of the small, old-fashioned grocery stores, to be replaced by supermarkets with adequate parking facilities. Three potential locations based on population distribution and ease of transportation are indicated on the map. The two along the northern boundary of the city would enter areas now largely unserved. Several sites for smaller, but modern stores are also indicated. Near the larger supermarkets on the north side there is room for supporting grocery stores to serve shoppers who dislike supermarkets and prefer more personal service. Rawlins Cross, at point 'E' would be a good location for a small supermarket, being situated at the neck of a large, hour-glass-shaped concentration of population. Suitable building sites in this locality, however, are not available at present.

Confectionery stores. Confectionery stores are widely scattered throughout the city, with the highest concentration in the older, more densely populated sections (see Figure 6). As a rule, they are very small establishments frequently housed in the former front rooms of private dwellings, while others are situated in small shacks. They specialize in candy, soft drinks, ice cream and tobacco products, but generally have a small selection of groceries and fruit. In fact, many are borderline cases with regard to their classification, the question being whether they are confectioneries or small grocery stores. Another characteristic of this type is that they generally remain open in the evenings and on Sundays. At present the number of confectioneries seems to be unduly high, and the increasing enlargement and modernization of food and beverage retail establishments will undoubtedly result in a decrease of confectioneries. Nevertheless, at new shopping centres, such as those on the north side, one or two new confectionery stores would successfully serve the after-hours requirements of the population.

Food specialty stores. Meat and fish stores are distributed chiefly in the older commercial and residential parts of the city (see Figure 7). Many of them are old-fashioned butcher shops with sawdust on the floor and cats sunning themselves contentedly in the windows. Their ranks may also be reduced by the keener competition of supermarkets. Fruit and vegetable stores and delicatessens, few in number,

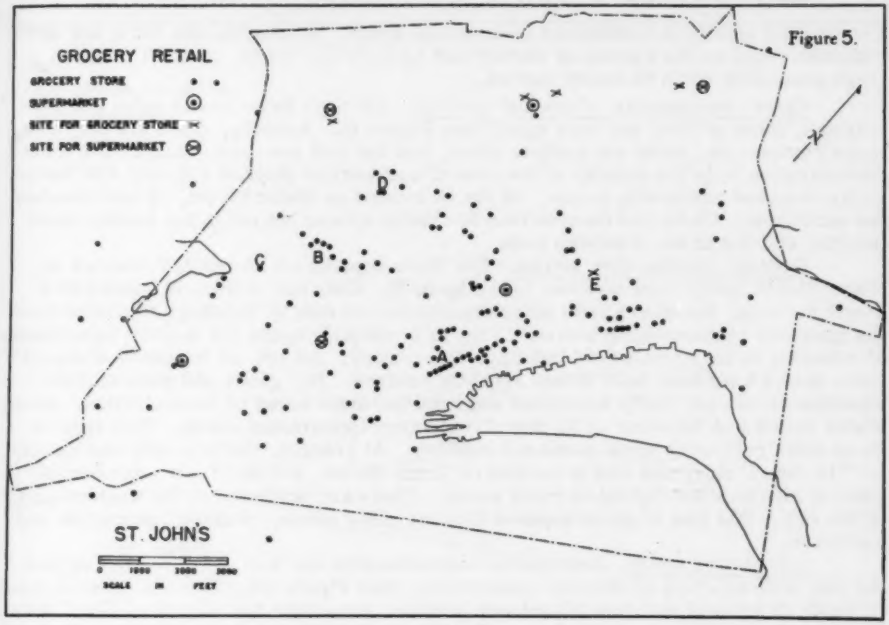

Figure 5.

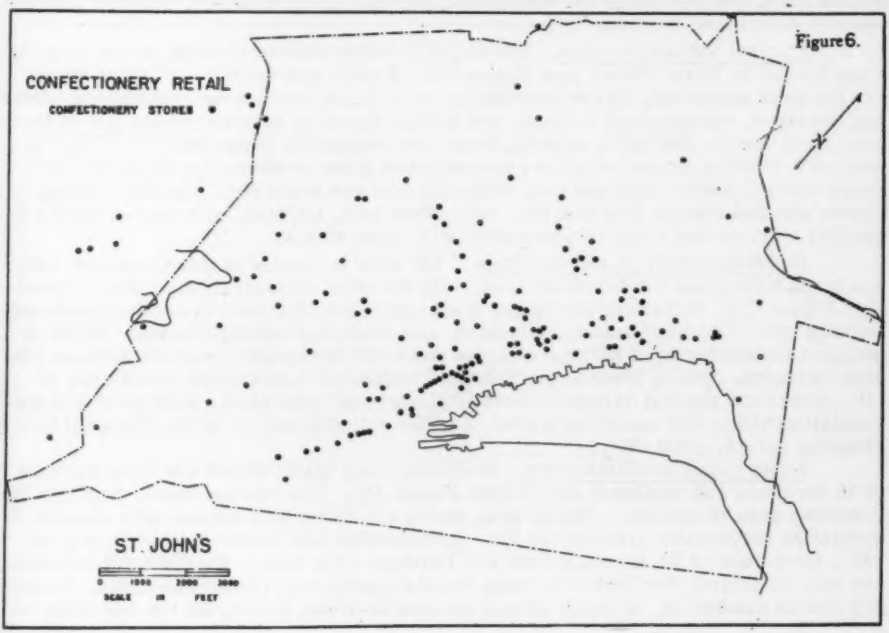

Figure 6.

are situated mainly in established commercial areas. A possible site for a new delicatessen would be the vicinity of Harvey and Lemarchant roads, point 'H', where a large population could be easily served.

Cafes, restaurants, clubs and taverns. Although there are 43 cafes and restaurants, most of them are very small (see Figure 8). Actually, there are only two large restaurants, about six medium sized, and the rest are small cafes. The main concentration is in the vicinity of the central commercial district and only four occur in far removed residential areas. Of the 13 located on Water Street, 12 are found on the north side. Clubs and taverns tend to cluster around but not in the central commercial district in the downtown area.

General merchandise stores. The three department stores are situated on Water Street fairly close together (see Figure 9). Only one of them is housed in a single building; the others have some departments in nearby buildings separated from the main one by intervening stores. They lack adequate space for modern departmental retailing in the cramped old buildings they occupy. As yet, no branches of department stores have been built in new shopping centres. Dry goods and general merchandise stores are fairly numerous and have two main areas of concentration, one on Water Street and the other at Harvey-Freshwater-Lemarchant roads. This type of store sells primarily piece goods and clothing. At present, there is only one variety or "15-cent" store and this is located on Water Street, but there are a number of general stores more typical of rural areas. These are scattered in the western part of the city. The line of goods handled includes piece goods, clothing, groceries and hardware.

Automotive trade. Automotive establishments are well scattered throughout the city with no areas of obvious concentration (see Figure 10). Service stations, most of which do general and specialized auto repairs, constitute the largest number. Automotive sales and service is the next most numerous group, and tire, battery, and accessory stores are but three in number.

Apparel and accessories. The major concentration of clothing stores is along a few blocks on Water Street (see Figure 11). Family and women's clothing stores are the most numerous, followed by shoes, men's and boy's wear, children's clothing, furriers, second-hand clothing, and custom tailoring establishments. All of the family and men's and boy's clothing firms are situated on Water Street. Of the 12 women's clothing stores, eight are concentrated in the western part of the Water Street central commercial district, while the rest are scattered. The few clothing stores situated outside this district, rather than being isolated, are located chiefly in smaller commercial areas in association with other stores.

Building materials and hardware. The establishments in this group are well scattered throughout the downtown area, with the chief concentration on Water Street (see Figure 12). Hardware stores are most numerous, followed by lumber yards and building materials; and heating, plumbing, and electrical establishments. There is no apparent clustering of hardware stores and a few favourable locations have not yet been occupied. One of these is the Harvey-Freshwater-Lemarchant roads area at 'H', where the nearest hardware store is almost one-quarter of a mile away and the population within that radius is 8,400. Another potential site is at the Churchill Square shopping centre, point 'K'.

Other retail establishments. Scattered along Water Street are 13 of the total of 18 furniture and appliance stores (see Figure 12). The rest are found chiefly in the downtown area of the city. The 24 drug stores are fairly well located with relation to population distribution (see Figure 13). A favourable new location would be at point 'M', the corner of Elizabeth Avenue and Portugal Cove Road. Florists and nurseries are well scattered, the nurseries being found in peripheral residential areas. Jewellery stores number 13, of which all are situated on Water Street, all but one being on

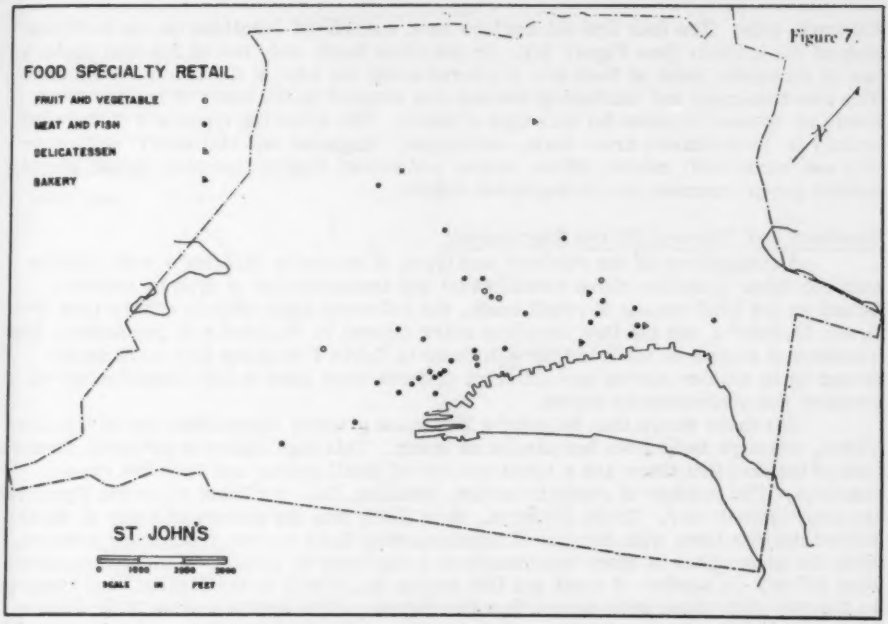

Figure 7.

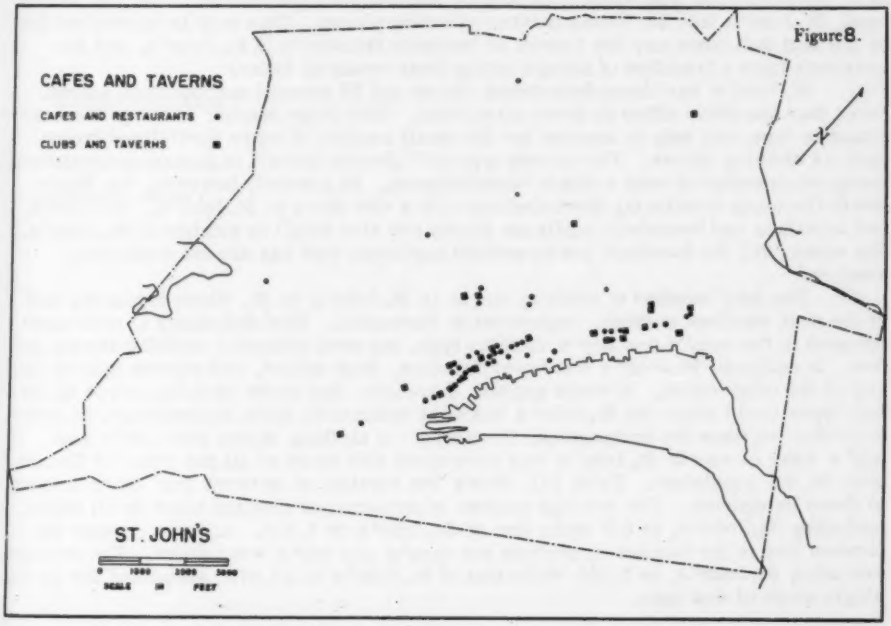

Figure 8.

the north side. The four fuel oil dealers have waterfront locations on the southeast side of the harbour (see Figure 14). On the other hand, only two of the coal dealers are at dockside; most of them are scattered along the edge of the downtown section. The two monument and tombstone dealers are situated in the heart of the downtown area, an unusual location for this type of store. The following types are distributed mainly in the downtown area: book, newspaper, magazine and stationery; gift, novelty and handicraft; music; office, store, and school supply; sporting goods; bicycle, optical goods; camera and photographic supply.

Numbers and Types of Stores Represented

A comparison of the numbers and types of stores in St.John's with similar data for other Canadian cities would reveal any inconsistency of type or number. Based on the 1951 census of retail trade, the following table affords comparison between St.John's and the five Canadian cities closest to St.John's in population. The numbers of stores do not coincide with those in Table I because they were determined by an earlier survey and different criteria were used in the classification of grocery and confectionery stores.

The table shows that St.John's has more grocery stores than any of the other cities, although Saint John has almost as many. This high figure is probably a reflection of the fact that there are a large number of small stores and very few supermarkets. The number of confectioneries, totalling 135, is almost twice the figure for the next-highest city, Trois Rivières. It is likely that the owners of many of these stores operate them with the aim of supplementing their income from other sources. With the appearance of more supermarkets a decrease in number of confectioneries may follow. In number of meat and fish stores St.John's is the highest, and Victoria is the only city which even approaches that figure. This specialization in St.John's is an old-fashioned type which also may be affected by supermarkets. On the other hand, St.John's has the lowest number of eating places. This may be accounted for by the fact that there are few tourist or business transients in St.John's, and the residents have a tradition of always eating their meals at home.

St.John's has three department stores and 26 general merchandise stores, more than the other cities in these categories. This large number of the general merchandise type may help to account for the small number of more specialized types, such as clothing stores. The variety type or "15-cent store" is almost non-existent, being represented by only a single establishment. At present, however, the Woolworth Company is entering Newfoundland with a new store in St.John's. Jewellery, and furniture and household appliance stores are also small in number in St.John's. But since 1951 the furniture and household appliance type has almost doubled in number.

The total number of clothing stores in St.John's is 35, which is exactly half of the next smallest number, registered in Saskatoon. This deficiency is most pronounced in the men's and boy's clothing type, but even women's clothing stores are few. In addition, St.John's has fewer furriers, shoe stores, and custom tailors than any of the other cities. It would appear, therefore, that more clothing stores of certain types could enter the St.John's business community quite successfully. In order to further validate the comparison, the number of clothing stores and men's and boy's wear stores in St.John's was contrasted with those of all the cities of Canada over 30,000 population. Table III shows the number of persons per store in each of these categories. The average number of persons per clothing store in all cities, excluding St.John's, is 617 while that of St.John's is 1,510. An even greater difference lies in the number of persons per men's and boy's wear store. The average, excluding St.John's, is 2,850 while that of St.John's is 52,873, accounted for by the single store of that type.

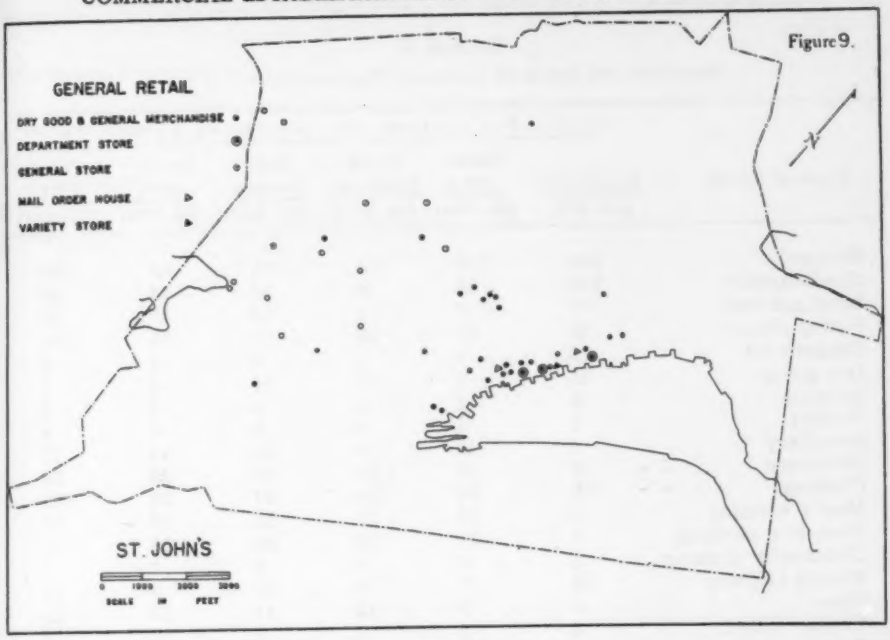

Figure 9.

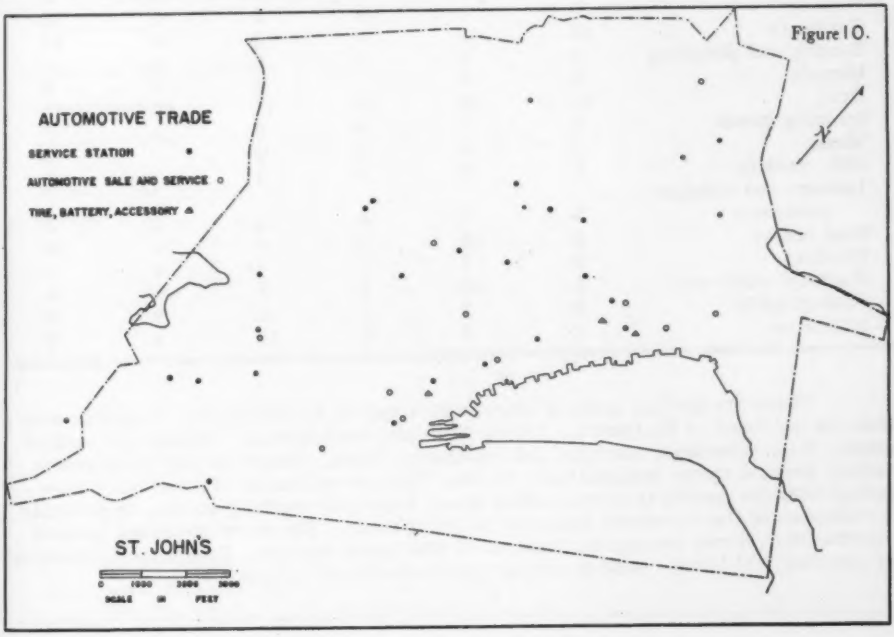

Figure 10.

TABLE II

Numbers and Types of Stores in Various Cities, 1951

Type of Store	City, Population and Numbers of Stores					
	St. John's (52,873)	Saint John (50,779)	Trois Rivières (46,074)	Sherbrooke (50,543)	Saskatoon (53,268)	Victoria (51,331)
Grocery	236	229	140	161	92	129
Confectionery	135	18	70	48	14	36
Meat and fish	27	10	2	10	15	25
Eating places	33	42	58	51	55	104
Department	3	1	1	2	2	2
Dry goods	26	8	11	15	4	9
General	6	2	3	1	5	3
Variety	1	4	8	5	6	4
Jewellery	8	14	14	21	15	19
Furniture	10	23	30	39	32	52
Clothing	35	77	134	97	70	126
Men's clothing	1	16	25	15	15	22
Women's clothing	7	17	18	20	28	41
Children's clothing	2	0	6	3	1	5
Family clothing	13	17	18	13	9	14
Shoe	6	9	12	11	10	15
Custom tailor	2	7	3	3	3	5
Furrier	2	3	9	5	4	5
Hardware	10	13	6	9	8	15
Heating and plumbing	4	3	1	0	3	4
Bicycle	4	0	9	3	1	3
Drug	21	29	15	17	32	24
Sporting goods	2	1	3	0	1	8
Music	2	2	3	0	1	3
Gift, novelty	6	3	0	3	1	15
Lumber and building materials	2	1	6	2	4	5
Coal dealer	2	18	3	4	12	16
Florist	3	7	2	4	4	7
Book and stationery	8	13	3	7	9	14
Photographic	2	2	4	1	2	7
Millinery	0	4	17	10	1	7

There are certain types of stores which appear in other cities of similar size that are not found in St. John's. Among these are the following: luggage and leather goods; floor coverings, curtains and upholstery; china, glassware and kitchenware; coffee, tea and spice; and millinery stores. The non-existence of these types, together with the paucity of certain other types, especially clothing stores, is probably a reflection of the old-world character of retail trade. The more numerous general merchandise stores are typical features of this characteristic. Future modernization of retailing will likely result in greater specialization of outlets.

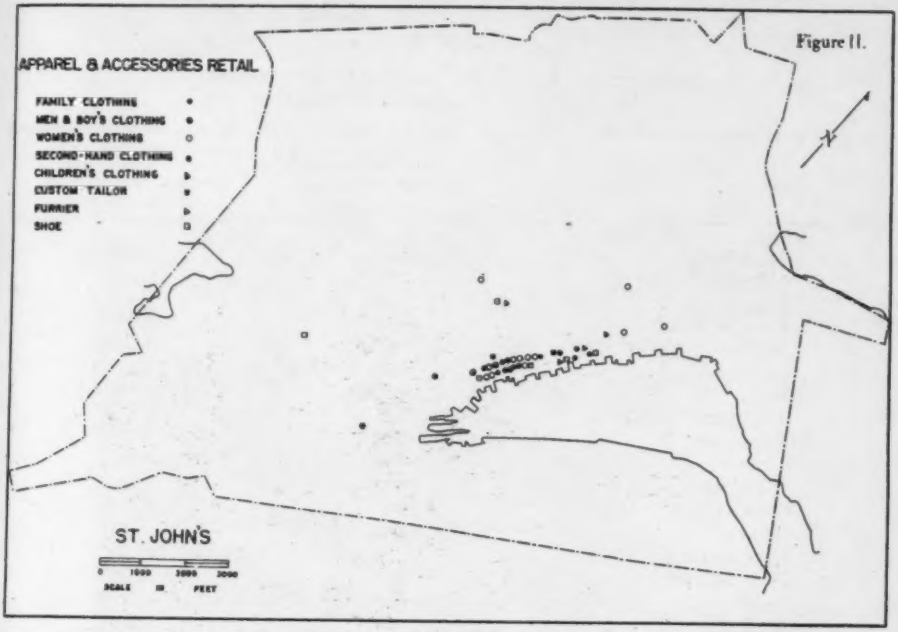

Figure 11.

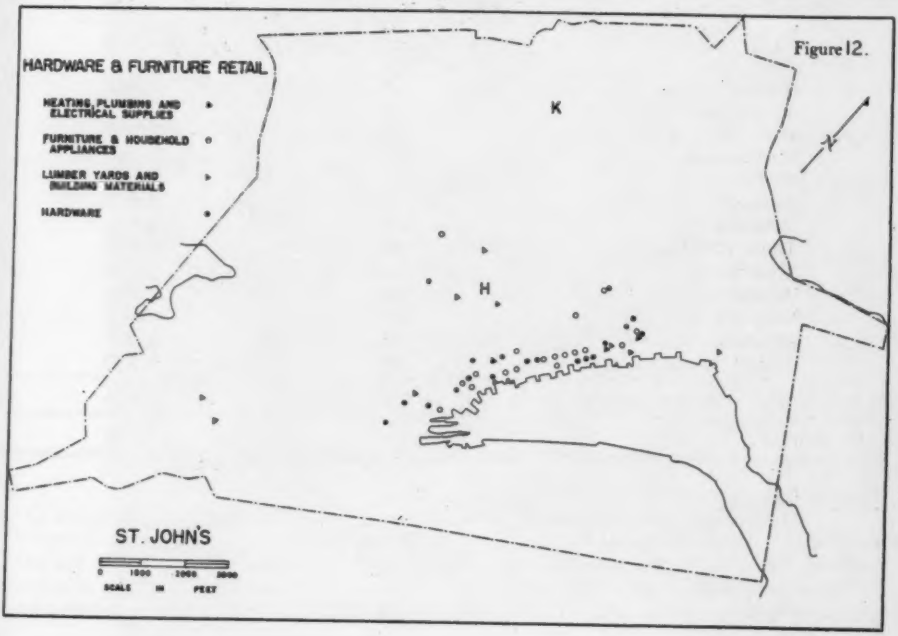

Figure 12.

TABLE III

Number of Persons per Clothing Store in Cities of Canada Over 30,000 Population, 1951

City	Number of Persons per Store	
	All Apparel and Accessories	Men's and Boy's Clothing
Brantford	459	1,836
Calgary	713	3,585
Edmonton	431	4,314
Fort William	832	2,912
Halifax	839	2,593
Hamilton	602	2,480
Hull	966	4,831
Kingston	506	1,968
Kitchener	498	2,136
London	599	2,804
Montreal	481	3,498
Oshawa	649	2,186
Ottawa	841	4,209
Peterborough	580	3,189
Port Arthur	741	1,947
Quebec	545	3,154
Regina	963	3,565
St. Catherines	452	1,726
St. John's	1,510	52,873
Saint John	659	3,173
Sarnia	619	2,041
Saskatoon	760	3,551
Sault St. Marie	457	2,318
Sherbrooke	521	3,369
Sudbury	642	1,570
Sydney	711	2,847
Toronto	396	1,871
Trois Rivières	343	1,842
Vancouver	481	2,632
Verdun	568	3,868
Victoria	407	2,333
Windsor	697	2,667
Winnipeg	793	4,209
Average all cities except St. John's	617	2,850
St. John's	1,510	52,873

Service Establishments

The service establishments in St. John's were not so completely mapped as the retail. Two main types omitted were barber shops and beauty parlors. Nevertheless, the distribution pattern which is essentially scattered is apparent in the remainder (see Figure 15). They seem to be distributed in and around all the commercial areas, with the exception of the central commercial district which is avoided by most types.

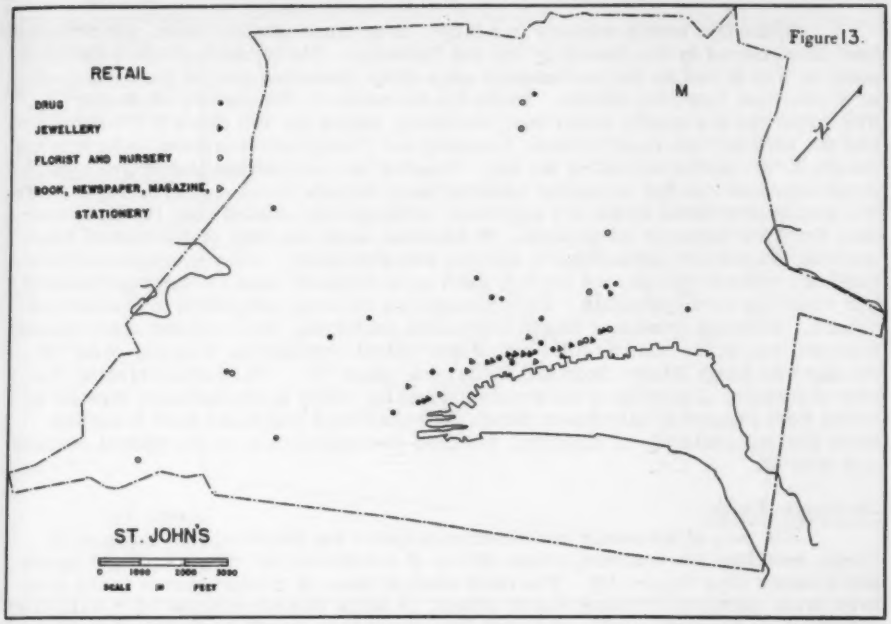

Figure 13.

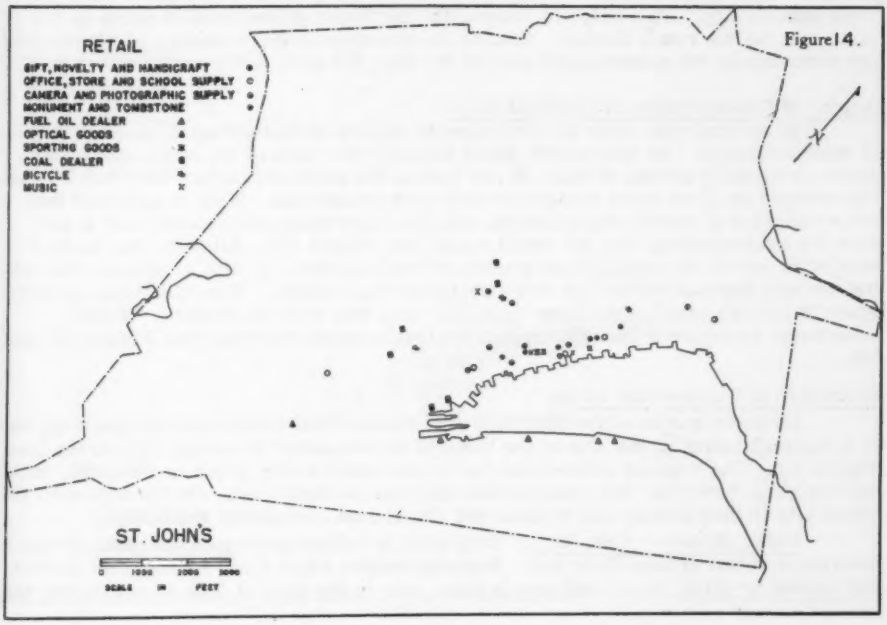

Figure 14.

Of the five hotels only one is a large, first-class establishment, the Newfoundland Hotel owned by the Canadian National Railways. The location of this hotel is unusual in that it lies on the northeastern edge of the downtown area at the opposite end of the harbour from the station. There are no motels in the vicinity of St. John's. The laundries are mostly small hand laundries, except for two which are mechanized and two self-service launderettes. Cleaning and dyeing services seem to be situated chiefly in the northwest half of the city. General and specialized automotive repair establishments are few in number because many service stations also do repairs. The two automotive rental firms are apparently strategically located near the Newfoundland Hotel for business advantages. At locations along the edge of the central commercial district are seven funeral service establishments. All are unimpressive old buildings without chapels and most of them were formerly used as carriage building and repairing establishments. They exemplify a business adaptation to modern conditions. Although many taxi stands are widely scattered, there are two main concentrations, one at the southwestern end of the central commercial district, point 'X', the other at Kings Bridge Road and Boulevard, point 'Y'. The former cluster lies near the centre of gravity of the population and the latter is strategically located to serve Fort Pepperrell Air Force Base. The chartered banks and their branches were also mapped and, as expected, the chief concentration is in the central commercial district.

Wholesale Trade

The map of wholesale establishments shows the distribution of three main types, merchant wholesalers, sales offices of manufacturing companies, and agents and brokers (see Figure 16). The chief concentration of wholesalers is in the downtown area, particularly along Water Street. A large number operate from waterfront premises on the harbour side of Water Street and many retail firms also carry on some wholesaling. This helps to account for the Water Street concentration in the same area as the retail cluster. Outside the downtown area, a number of wholesalers are scattered in the southwestern part of the city, but none in the northwestern half.

Degree of Concentration of Establishments

An attempt was made to determine the degree of concentration of specific types of establishments. To accomplish this a boundary for each of the major types was drawn arbitrarily around at least 80 per cent of the establishments. Only those types represented by 10 or more establishments were considered. When it appeared that the boundaries of certain types almost coincided they were grouped together to produce the accompanying map for retail trade (see Figure 17). Although this method results in merely an approximate picture of concentration, it does emphasize the fact that certain types of stores are more scattered than others. The rural-type general store is the only one that deviates radically from this orderly zonation. Similar boundaries were drawn for service and wholesale establishments (see Figures 15 and 16).

Character of Commercial Areas

An investigation of the distribution of commercial establishments leads logically to a regionalization of the city on the basis of the character of commercial areas (see Figure 18). The regions defined may be termed commercial areas or districts, without implying, however, that commercial land use predominates. On the contrary, the whole city is thus divided and some areas are almost completely residential.

Water Street - Area No. 1. This area is defined mainly on the basis of nearly continuous retail ground-floor use. Building heights range from one to three stories and second or third floor retail use is found only in the case of department stores and

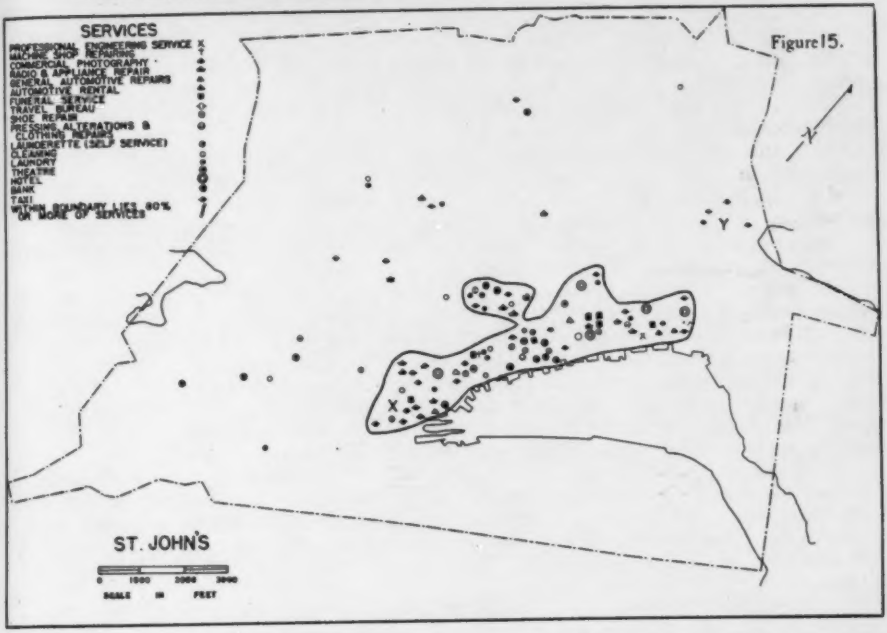

Figure 15.

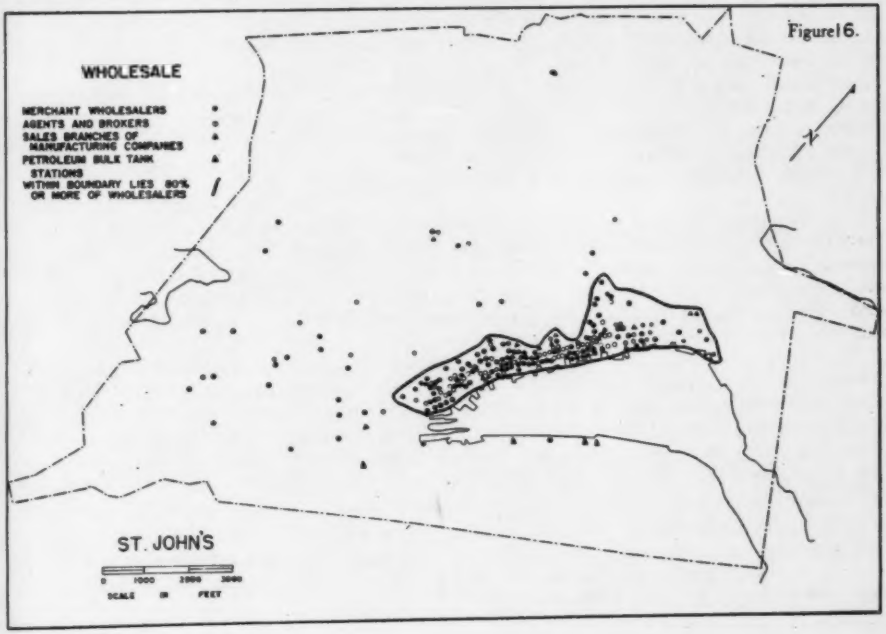

Figure 16.

one clothing store. Upper floors are utilized chiefly as storage and office space. In addition, the area has other characteristics that make it unique as the central commercial district.[1]

All of the department stores and most of the clothing and jewellery stores are situated here. Also, there is a large concentration of dry goods, hardware, and furniture and appliance establishments, and numerous cafes, banks and specialty stores such as drugs, sporting goods and books. The majority of wholesalers are found in this district. On the other hand, food and beverage stores other than cafes are scarce, being represented by two groceries connected with department stores, two meat markets, three taverns, and a few confectioneries. Automotive establishments are non-existent and services are few in number.

Within the district the department, clothing, and jewellery stores seem to be largely confined to a central segment, which undoubtedly contains the peak land value, although these figures are not available. The department stores, furriers, and shoe stores occupy the northeastern part of the district, while the men's and women's clothing stores and most of the cafes are confined to the southwestern part. Other types, such as family clothing and jewellers, are spread more evenly throughout the area. The waterfront side of the street is occupied by the department stores and many large stores. In contrast, the opposite side has far more small stores.

The main centre of business activity and, in fact, the boundaries of the central commercial district do not seem to have shifted appreciably in recent years. This waterfront street has always been the business centre, and growth along parallel streets inland has been impeded by the steepness of the hill. Moreover, there are still sites for new buildings on Water Street in replacement of presently unused premises.

New Gower Street - Area No. 2. The condition of business establishments on New Gower Street reflects a lower standard of prosperity than other areas. Many of the stores are dilapidated and most of them are small. Very few have modern fronts and attractive merchandise displays. Retail ground floor use along the street is not so continuous as on Water Street, being interspersed with occasional residences. Upper floors are predominantly occupied by dwelling units. The food and beverage group accounts for the majority of retailers. Here is a large number of grocery, confectionery, and meat and fish stores, together with cafes and taverns. Some other stores, such as hardware, dry goods, and second-hand clothing, are represented by a few establishments. In addition, there are some services and a number of wholesale firms.

Duckworth Street - Area No. 3. The business area at the northeastern end of Duckworth Street is confined to the northwest side of the street. Similar to New Gower Street, the ground floor is mainly retail with dwellings on upper floors. Present are several large groceries and other food stores, including cafes and taverns, and a few hardware, heating, dry goods, and clothing stores. A number of services and wholesalers are included in the district.

Southwestern end of Water Street - Area No. 4. Extending beyond the end of the central commercial district, this area is characterized by scattered retail and wholesale establishments. Low-standard housing flanks many stores and many of the establishments themselves are in disrepair. The most numerous stores are confectioneries and groceries. There is a small number of other types, including hardware, dry goods, second-hand clothing, and drugs, and a heavy concentration of taxi stands.

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[1] The term "central business district" is not used because Murphy, et.al. has provided a specific definition of its boundaries that was not adhered to in this case.

Murphy, Vance and Epstein: Central Business District Studies; Clark University, Worcester, Mass., 1955.

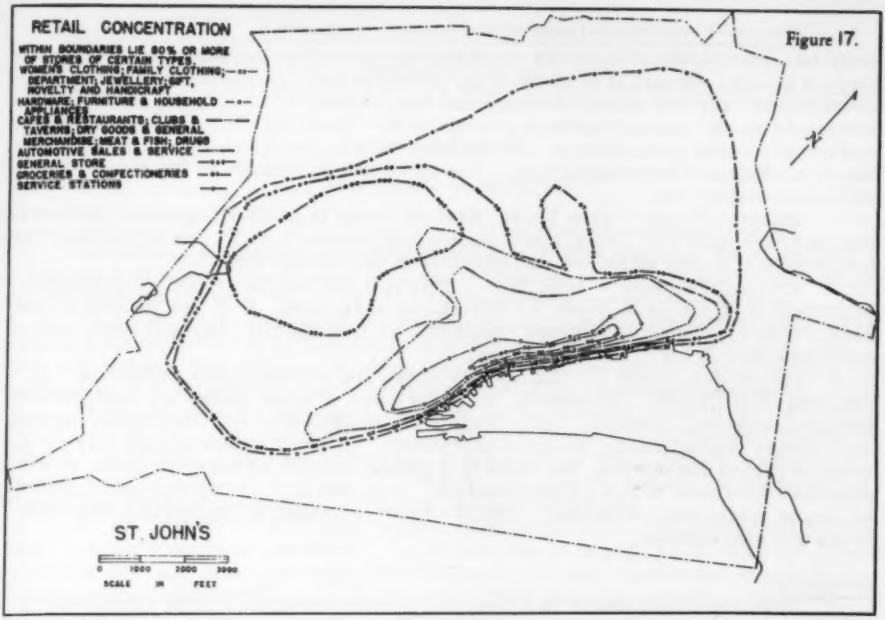
RETAIL CONCENTRATION
WITHIN BOUNDARIES LIE 80% OR MORE OF STORES OF CERTAIN TYPES
WOMEN'S CLOTHING; FAMILY CLOTHING; DEPARTMENT; JEWELLERY; GIFT, NOVELTY AND HANDICRAFT
HARDWARE; FURNITURE & HOUSEHOLD APPLIANCES
CAFES & RESTAURANTS; CLUBS & TAVERNS; DRY GOODS & GENERAL MERCHANDISE; MEAT & FISH; DRUGS
AUTOMOTIVE SALES & SERVICE
GENERAL STORE
GROCERIES & CONFECTIONERIES
SERVICE STATIONS
ST. JOHN'S
0 1000 2000 3000
SCALE IN FEET

Figure 17.

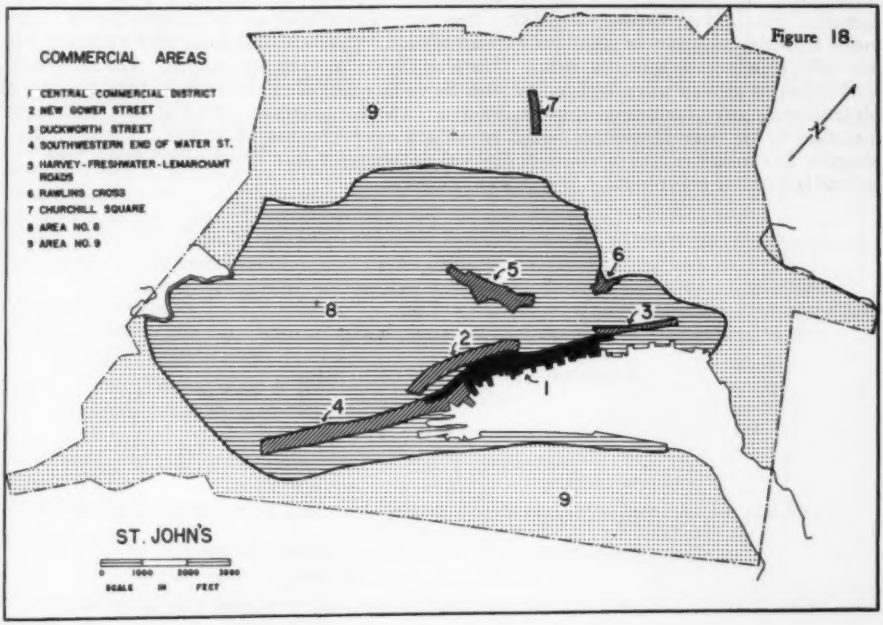

Figure 18.

Harvey-Freshwater-Lemarchant Roads - Area No.5. Clustered around a main intersection at the top of the slope rising up from the harbour is a wide assortment of stores, especially of the food and beverage type. Represented also in this concentration are dry goods, clothing, and drug stores, and a bicycle, photographic, and music store. Among services are two banks, three laundries, a radio repairer and a commercial photographer. Essentially, this is a neighbourhood retail centre where wholesalers are insignificant. The retail use is confined to the ground floor and is non-continuous.

Rawlins Cross - Area No.6. Rawlins Cross is another important intersection that had developed into a very small commercial concentration. Predominantly retail, it has quite a variety of stores, but only one or two of each type.

Churchill Square - Area No.7. This is a new neighbourhood shopping centre at present occupied by only half a dozen stores and a bank. It is well located in the heart of the rapidly expanding new residential area of the city, and will likely attract more business firms in the near future.

Areas Nos. 8 and 9. The last two areas are predominantly residential and business is scattered. Throughout, the chief types of retail stores are confectioneries and groceries. Area No.8 includes numerous wholesale establishments, as well as grocery, confectionery, and specialty stores. General stores appear only in the western part of the district, but there is a greater density of business firms in the downtown area than in this western section. Area No.9, covering the rest of the city, is almost completely residential. Retail stores are widely scattered and wholesale firms are non-existent.

Summary

The city of St.John's has been analysed systematically from a commercial viewpoint. Mapping of commercial establishments was carried out to achieve distributional patterns of individual types. The maps permitted the determination of business location relative to population distribution. This enabled a further evaluation of the effectiveness of specific retail distributions in serving the people. The numbers and types of stores were compared with those in other Canadian cities with the aim of discovering any peculiarities in St.John's. The comparison revealed business opportunities in the case of certain retail types and overcrowding in others. Finally, the degree of concentration of commercial establishments was determined and a regionalization of commercial areas was achieved.

EVOLUTION DEMOGRAPHIQUE DE LA POPULATION RURALE DANS 60 PAROISSES DE LA PROVINCE DE QUEBEC DEPUIS LE DEBUT DU SIECLE

Gilles Boileau

Université de Montréal

Un examen démographique même sommaire montre que nous assistons présentement à un dépeuplement progressif des campagnes et à un gonflement continu des grosses agglomérations.

Ainsi, en 1901, au Canada, le pourcentage de la population rurale était de 63 pour cent tandis qu'en 1951, la population rurale ne comptait plus que 43 pour cent de la population totale du pays. Il s'est donc opéré des changements de première importance dans la structure de la population rurale au Canada depuis le début du siècle.

Cette évolution est cependant variée et les modalités n'en sont pas les mêmes dans toutes les régions. A cet effet, la SOCIETE CANADIENNE D'ETABLISSEMENT RURAL, organisme chargé du regroupement des familles d'immigrants catholiques et également d'établissement rural, a mené depuis 1954 une enquête démographique et sociologique dans quelque 60 paroisses du Canada français.

Le but de cette enquête était double: premièrement, elle visait à déterminer avec le plus d'exactitude possible la vitalité actuelle de la population rurale en général et surtout des paroisses agricoles; deuxièmement, obtenir les données statistiques nécessaires à l'élaboration d'un programme d'établissement rationnel, conçu et orienté selon des bases certaines et scientifiques.

Cette enquête, qui d'ailleurs se continue actuellement, nous a permis de recueillir des données diverses se rapportant à environ 60,000 individus répartis dans un peu plus de 10,000 familles. Nous avons donc pu atteindre ainsi près de cinq pour cent des familles rurales du Québec, ce qui constitue tout de même un échantillonnage bien représentatif.

Comme cette enquête a pu être conduite grâce à la collaboration active de NN. SS. les Evêques et de MM. les Curés, nous avons donc dû procéder par diocèses. Les diocèses où s'est poursuivie l'enquête, sont, par ordre d'importance, les suivants: Sherbrooke, Nicolet, Joliette, Rimouski, Valleyfield, Timmins, Saint-Anne-de-la-Pocatière, Québec, Saint-Hyacinthe et Ottawa. Trois paroisses des diocèses de Saint-Boniface, au Manitoba, et de Gravelbourg, en Saskatchewan, ont également collaboré à cette enquête.

La division du travail par diocèses répondant à des exigences matérielles essentielles pour la conduite de cette enquête, nous pouvons quand même grouper les paroisses selon des divisions géographiques naturelles qui seraient les suivantes:

1. le Bas-du-Fleuve ou rebord sud de l'estuaire,
2. le Sud du Bassin du lac Saint-Pierre,
3. les Cantons de l'Est,
4. la Plaine de Montréal,
5. la région de Joliette et des Laurentides.

Nous pourrions y ajouter deux régions de moindre importance, à savoir:

1. l'Ouest du Québec (Ottawa et Témiscamingue),
2. la région de Québec.

Les résultats que nous avons pu obtenir de cette enquête sont bien évocateurs et ne sont pas sans nous révéler quelques tendances actuelles de la population rurale

canadienne-française. Cependant, en raison de cette coupe de seulement cinq pour cent de la population rurale, nous ne pouvons tirer des conclusions qui soient définitives et valables pour la totalité de la population rurale canadienne-française. D'ailleurs une autre des raisons qui nous incitent à apporter quelques réserves quant à la précision de l'enquête, réside dans la façon dont les formulaires d'enquête ont été remplis. En général, les enquêteurs (en l'occurrence les curés des paroisses) ont abuttu de l'excellente besogne, mais il y a bien ici et là les traditionnelles exceptions qui viennent confirmer la règle. Toutefois, la marge d'erreur due à ces déficiences est négligeable et ne peut influencer le résultat global de l'enquête.

Plus d'une trentaine de questions furent posées aux personnes interrogées. Les principales de ces questions avaient trait à l'âge actuel des parents, leur âge à l'époque de leur mariage, le nombre d'enfants dans leur famille d'origine, leur diocèse d'origine, le nombre de leurs enfants, et l'âge de ces derniers. D'autres questions avaient trait au degré d'instruction et à l'établissement. Comme le principal but de l'enquête était de connaître avant tout la vitalité du milieu rural, ceci explique le grand nombre de questions relatives à l'âge des individus et au nombre des enfants.

Les transformations démographiques qu'a subies la province de Québec depuis un demi-siècle ne sont pas négligeables. En effet, l'humanité rurale, si stable dans sa composition sociale, a connu depuis le début du siècle, une véritable révolution démographique. De nombreux changements sont intervenus, non seulement dans l'ensemble de la population rurale mais jusque dans le plus petit et le plus reculé des villages.

Des 60 paroisses où fut menée l'enquête, 26 seulement étaient érigées (civilement) au début du siècle. De toute façon, en suivant l'évolution de la courbe de la population de ces paroisses, nous constatons facilement toute l'ampleur de cet exode rural. Ainsi, dans ces paroisses, alors que la population était d'un peu plus de 34,000 habitants en 1901, elle dépassait à peine 33,000 un demi-siècle plus tard, soit une perte brute de 1,000 habitants en l'espace de 50 ans. Si éloquent que puisse paraître ce chiffre, il est encore loin de la réalité. En effet, en appliquant un taux d'accroissement naturel moyen de 20 pour 1,000 à la population de 1901, nous aurions dû retrouver, 50 ans plus tard, une population totale normale de 85,000 habitants. La population réelle n'était cependant que de 33,000 habitants. Il y eut donc une perte réelle de 52,000 habitants approximativement dans 26 paroisses rurales du Canada français depuis le début du siècle, pour une moyenne annuelle de 40 habitants par paroisse.

Cet exode rural ne s'est pas fait sentir également dans toutes les régions. Ainsi, dans la région du Sud du lac Saint-Pierre, dans le même demi-siècle, les pertes annuelles par paroisse étaient de 53. Dans la plaine de Montréal, elles se chiffraient à 41, tandis qu'elles étaient de 35 dans les Cantons de l'Est et de 28 sur le rebord sud de l'estuaire du fleuve Saint-Laurent.

Ces chiffres valent pour 50 ans, mais si nous examinons la situation telle qu'elle se présente à nous au cours des dernières années, nous constatons une diminution du nombre-moyen des pertes. En effet, en 1955, la population totale des paroisses où nous avons fait enquête se chiffrait à 56,472 habitants tandis qu'elle était de 56,337 en 1948, enregistrant ainsi un gain brut de 137. Toutefois, si l'on applique au chiffre de population de 1948 au taux minimum d'accroissement naturel de 20 pour 1,000, nous aurions dû retrouver en 1955 une population globale de 64,869. Dans ces paroisses, les pertes réelles auraient atteint un minimum de 8,397 individus, pour une moyenne annuelle par paroisse de 24. Pour l'ensemble du demi-siècle, cette moyenne est de 40. Comme le chiffre de la population n'a pratiquement pas varié de 1948 à 1955, le total des pertes réelles est donc équivalent au surplus de population qu'aurait dû procurer normalement un accroissement naturel minimum de 20 pour 1,000. Dans les paroisses rurales, l'immigration étant négligeable, nous n'en avons tenu aucun compte, d'autant plus que les chiffres relatifs à l'entrée des nouveaux résidents dans les paroisses n'existent pas.

Les régions qui eurent à subir les plus lourdes pertes, au cours des dernières années, sont les suivantes: Les Cantons de l'Est, avec une perte annuelle de 27 habitants par paroisse; le Bas-du-Fleuve: 20; la région de Joliette: 20; la partie Sud du Bassin du lac Saint-Pierre: 20.

La diminution du chiffre moyen des départs peut être occasionnée par diverses causes, entre autres: l'arrêt, depuis les années '30 déjà, de l'émigration massive vers les Etats-Unis, une stabilité économique relative, une meilleure orientation et un meilleur emploi des ressources agricoles et enfin une diminution de la natalité, cette dernière raison étant la plus importante puisqu'elle entraînait avec elle une diminution du nombre des sujets à l'émigration.

Au total, la population de ces paroisses rurales, est donc demeurée stable au cours des dernières années (apparamment) mais en réalité les pertes qu'elle a subies l'ont sensiblement affectée dans sa structure interne; les émigrants étant habituellement les sujets les plus jeunes et les plus aptes à assurer le remplacement.

Tout mouvement de population peut résulter de deux processus: diminution naturelle par excédent des décès sur les naissances; diminution par émigration. En étudiant la courbe de l'évolution de la population, nous avons vu que les pertes qui ont marqué cette dégringolade démographique ont été très importantes. Nous verrons maintenant si elles sont le fruit d'une diminution de l'accroissement naturel ou d'un vaste mouvement d'émigration.

Le taux de natalité des paroisses que nous avons visitées s'élève à 34.6 tandis que le taux de mortalité est de 11.1. Donc: un accroissement naturel de 23.5 -/1,000 taux que l'ont peut considérer comme élevé.

Les taux que l'on peut considérér comme les plus élevés se rencontrent dans la région du Bas-du-Fleuve tandis qu'au contraire la région sise au Sud du Lac Saint-Pierre fait voir une forte mortalité.

Une étude de la fécondité générale vient confirmer davantage le fait que la dépopulation rurale n'est en rien due à un excédent des décès sur les naissances.

Bien que le taux d'accroissement naturel et que l'indice de la fécondité générale de ces régions aient été sensiblement plus élevés au début du siècle, il n'en demeure pas moins vrai qu'ils sont encore aujourd'hui parmi les plus élevés du pays.

La fécondité générale (c'est-à-dire le rapport entre le nombre des naissances et le nombre de femmes entre 15 et 49 ans) dans les régions rurales soumises à l'enquête atteignait un taux de 145 pour 1,000. La région du Bas-du-Fleuve se place au premier rang avec un indice de 162 pour 1,000; viennent ensuite les Cantons de l'Est avec 152; le Sud du lac Saint-Pierre avec 139; la région de Joliette et des Laurentides avec 124 et enfin la Plaine de Montréal avec 120 naissances pour 1,000 femmes.

Nous avons également calculé un second indice de fécondité, différent du premier et se composant des éléments suivants: à savoir, au numérateur, le nombre d'enfants vivants de moins de cinq (5) ans, et, au dénominateur, le nombre de femmes entre 15 et 49 ans. Le Bureau Fédéral de la Statistique identifie ce dernier indice sous le nom spécifique de "QUOTIENT DE REMPLACEMENT PERMANENT". Afin d'assurer le remplacement de la population du Québec, les experts du même Bureau ont établi le minimum souhaité de ce quotient aux environs de 360. (La valeur de ce quotient étant sensiblement égale à celle du taux de reproduction brute).

Ainsi calculé, le quotient de remplacement permanent de nos paroisses rurales atteint 580. Toutefois, la région du Bas-du-Fleuve se distingue tout particulièrement avec un indice de 760 tandis que celui de la plaine de Montréal dépasse à peine 400. Les deux paroisses de Saint-Jean-de-la-Lande et de l'Ascension de Matapédia présentent des quotients supérieurs à 825, tandis que quelques paroisses de la région située au Sud du Lac Saint-Pierre offrent des quotients à peine supérieurs au minimum requis pour assurer le remplacement. Dans ce dernier cas, même si le quotient est légèrement supérieur au minimum requis, ces paroisses accusent malgré

tout une diminution graduelle de leur population pour la simple raison que la presque totalité des jeunes qui contractent mariage dans la paroisse, n'y demeurent pas après leur mariage.

Dans les régions couvertes par notre enquête, tous les quotients obtenus marquent une augmentation sur les chiffres correspondants de 1941. Cependant, de 1931 à 1941, il y avait eu dégringolade générale, de sorte que les chiffres de 1951 et 1954 (année de l'enquête) sont à peu près au même niveau que ceux de 1931, peut-être leur sont-ils légèrement supérieurs. Au cours des prochaines années, la courbe aura tendance à se stabiliser. Une chose est certaine: si les chiffres obtenus au cours de notre enquête marquent un gain appréciable sur 1941, ils accusent quand même une perte appréciable sur ceux du début du siècle.

L'âge moyen des époux et des épouses, en milieu rural, est actuellement de 45.5 et de 42 ans respectivement, avec un minimum, dans la paroisse de Belleterre, en pays de colonisation de 39 ans pour le père et de 35 ans pour la mère et un maximum de 52 et de 48 ans respectivement dans la vieille paroisse de Kamouraska, paroisse établie depuis déjà près de deux siècles et demi. C'est toutefois dans la partie Sud du bassin du lac Saint-Pierre que l'on rencontre les paroisses où l'âge des époux est le plus élevé. Ces pères et mères de famille qui ont en moyenne 45.5 et 42 ans ont contracté mariage alors qu'ils étaient âgés de 26 et 22.5 ans respectivement. Les conjoints ainsi interrogés au cours de l'enquête avaient donc une moyenne de près de 20 ans de vie conjugale. L'âge au mariage varie sensiblement cependant d'une paroisse à l'autre, d'une région à une autre. Ainsi, à Saint-Jean-de-la-Lande, comté de Témiscouata, l'âge au mariage est de 24 ans pour les hommes et de 19.5 pour les femmes, tandis qu'à Kamouraska, dans le comté du même nom, on s'est épousé alors qu'on avait déjà 30 ans et 26 ans respectivement.

Les chefs de famille qui ont répondu à nos interrogatoires étaient eux-mêmes originaires de familles nombreuses. Dans ces familles le nombre moyen d'enfants était de 8.6 avec des minima de 7.7 dans les paroisses des Cèdres, dans la Plaine de Montréal, et à Abercorn, dans les Cantons de l'Est. Dans les paroisses de l'Ascension de Matapédia, dans le Bas-du-Fleuve, et à Island Brook, dans les Cantons de l'Est, nous rencontrons des maxima de 13.4 et de 12.5

Ici, la comparaison entre le nombre d'enfants dans les familles d'origine et le nombre d'enfants dans les familles actuelles s'impose. Ainsi, actuellement, dans les 10,000 familles de notre enquête, on rencontre une moyenne de 2.45 garçons et de 2.3 filles pour un total de 4.75 enfants par famille. Cette moyenne de 4.75 est comprise entre des minima de 3.5 et de 3.8 respectivement pour les paroisses de Saint-Mathieu-de-Beloeil et de Rigaud, deux paroisses où les fonctions urbaines se manifestent de plus en plus, et des maxima de 7.6 et 7.2 pour les paroisses de l'Ascension de Matapédia et Saint-Jean-de-la-Lande.

Cette dernière comparaison est forcément inexacte puisque dans les familles actuelles, elle ne fait aucune différence entre celles qui sont déjà complétées et celles où il peut y avoir encore des enfants à venir. Ainsi, afin de rectifier notre comparaison, nous la reprendrons, mais non plus en tenant compte de toutes les familles actuelles mais bien uniquement de celles qui peuvent avec raison être considérées comme complétées, c'est-à-dire celles où la mère est âgée de 50 ans ou plus. Dans ce dernier cas, la moyenne d'enfants n'est plus de 4.75 enfants par famille mais plutôt de 6.8 à Abercorn, cependant, la moyenne est de seulement 4.5 enfants par famille tandis qu'elle est de 13.2 à Saint-Jean-de-la-Lande. Donc, la comparaison entre les enfants des familles de la génération présente et celle de la génération précédente se fait maintenant entre des familles de 8.6 et 6.8 enfants. La perte est donc de près de deux (2) enfants en passant d'une génération à la suivante, et dans certaines paroisses, le déficit atteint parfois quatre (4) enfants. C'est le cas de St-Félix-de-Valois, Saint-Lin, Saint-Edmond, Saint-Esprit dans le diocèse de Joliette; de Saint-Louis-de-Blandford et Saint-Célestin dans le diocèse de Nicolet;

Rigaud et Saint-Polycarpe dans le diocèse de Valleyfield; Saint-Arsène dans le diocèse de Rimouski et Abercorn dans le diocèse de Sherbrooke.

Si nous examinons la composition par âges de cette population rurale, nous y relevons deux faits caractéristiques. La proportion des jeunes (moins de 20 ans) touche presque 50 pour cent tandis que celle des vieux (plus de 60 ans) se situe à 10 pour cent. Il y a donc dans ces paroisses rurales deux vieillards pour 10 jeunes. Mais c'est entre les tranches de 20 et 50 ans que l'on découvre de graves anomalies. En effet, la pyramide de cette population présente entre ces âges de larges échancrures - caractéristiques d'une population ouverte sans cesse ravagée par une émigration intensive de la part de ses meilleurs éléments. Au total, la pyramide rurale repose sur une base large mais à partir de 20 ans elle se rétrécit brusquement et de façon exagérée: c'est l'âge de l'émigration vers les villes. Ce déséquilibre de la composition comporte inévitablement de graves conséquences pour les paroisses, tant sur le plan social que matériel.

Cette émigration massive des plus de 20 ans se fait davantage sentir chez l'élément féminin que chez les garçons et les hommes mariés. C'est ainsi qu'entre les âges de 15 et 19 ans, dans les paroisses où s'est faite l'enquête, il y a une proportion de 114 garçons non-mariés pour 100 filles; cette proportion est de 147 entre 20 et 24 ans tandis qu'elle est de 162 entre 25 et 29 ans et de 128 entre 30 et 34 ans.

Toutefois cette répartition proportionnelle des enfants non-mariés par tranche d'âge varie sensiblement d'une région à l'autre, selon que l'attrait exercé par les grands centres est plus ou moins important ou pour d'autres motifs personnels. De toute façon, c'est la région des Cantons de l'Est qui souffre le plus de cette disproportion entre le nombre de filles et le nombre de garçons. En effet, alors qu'il y a 196 garçons pour 100 filles, entre 20 et 24 ans, dans les Cantons de l'Est, il y en a 153 dans la région Sud du Bassin du lac Saint-Pierre, 130 dans la région du Bas-du-Fleuve, 140 dans la Plaine de Montréal, et 114 dans la région de Joliette. Par contre, entre 25 et 29 ans, il y a dans les Cantons de l'Est 242 garçons contre 100 filles, dans la région au sud du Lac Saint-Pierre: 225, dans le Bas-du-Fleuve; 153; dans Joliette: 127; et dans la Plaine de Montréal: 104.

La conclusion qui s'impose d'emblée à la suite de cet examen de la situation c'est que les jeunes filles quittent très tôt le milieu rural pour se diriger vers la ville. En effet, actuellement, sur 100 filles originaires du milieu rural, nous en retrouvons 44 dans les centres urbains, 31 dans les villages ou centres mi-urbains mi-ruraux, et 20 en milieu strictement agricole. Chez les garçons 40 ont également quitté leur milieu pour aller vers la ville, 33 habitent les centres mixtes et 22 demeurent en milieu agricole.

La répartition proportionnelle des genres d'établissement varie cependant selon les différentes régions et également selon la situation de ces régions par rapport aux grands centres urbains. En outre, la situation économique de la région d'origine constitue une des principales raisons susceptibles d'influencer un jeune: à savoir s'il quittera son coin de terre ou s'il y restera afin d'y gagner sa vie. Ainsi, l'attrait de la ville se manifeste beaucoup plus dans la Plaine de Montréal et dans les Cantons de l'Est que dans les autres régions. Par contre, la région du Bas-du-Fleuve est celle où cet appel des villes se fait le moins impérieux. Conséquemment, c'est dans cette même région que l'on trouvera le plus grand nombre d'habitants encore rattachés au sol d'une façon directe. Mais c'est là une des rares régions où la vitalité de la population soit encore à un niveau très élevé et où l'influence des grands centres urbains ne se fasse pas encore sentir d'une façon décisive.

Dans un pays où la population des campagnes a diminué d'un demi-million, tandis que la population totale s'accroissait de plus de deux millions, on peut parler

(sans crainte d'erreur) d'exode rural. [1] Les paroisses rurales de la province de Québec ont connu cet exode et en subissent encore les effets de façon non-équivoque.

Analyser les raisons de l'exode rural actuel est chose délicate; bien des facteurs y ont concouru, dans des proportions variées, selon les régions, les époques et les individus. [2] Tous ces facteurs cependant produisent le même effet. Ils détournent le jeune rural de la campagne et imprime en lui le désir d'émigrer: La campagne perd ainsi, à un rythme qui va s'accélérant, ses habitants au profit des grandes villes qui absorbent ainsi la quantité d'individus nécessaires à leur développement et que se refuse à leur fournir un accroissement naturel insuffisant.

Soumise à une évolution démographique accentuée depuis 50 ans, la société rurale connaîtra une véritable révolution de son économie qui changera considérablement la structure des différentes régions. Ces modifications nouvelles entraîneront avec elles une transformation de l'économie rurale qui devra être organisée en fonction d'une mécanisation poussée des moyens de production.

Afin de parer à un développement trop inégal de nos différentes régions rurales, il faudra viser à établir entre chacune de ces régions un certain équilibre qui les ferait se développer intégralement.

Un des meilleurs moyens de réaliser cet équilibre consisterait dans l'aménagement du territoire, aménagement conçu non seulement en fonction de l'expansion économique mais en fonction également de la montée humaine de tous les éléments de la population.

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[1] Veyret, Paul: "La Population du Canada"; La Revue de Géographie Alpine, XLI, 1953, p.244.

[2] Lebeau, René: La vie rurale dans les montagnes du Jura méridional; Institut des Etudes Rhodaniennes de l'Université de Lyon, 1955, p.265-266.

A SUGGESTED RESOLUTION ON THE TEACHING OF GEOGRAPHY

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During the last few years Canadian professional geographers appear to have awakened to their full responsibility to the grade school and high school teacher and student of geography. More and better textbooks suited either to local or national needs have been written, summer sessions of universities are now catering to the teacher of geography and numerous articles on the teaching of geography or social studies have been published in geographical and educational journals throughout Canada. In addition several university departments of geography are currently circulating regular newsletters to teachers of geography or social studies in local schools. In May 1955 an Education Committee was set up by the Canadian Association of Geographers, "to deal with teaching aids and aid to be given to teachers teaching geography in Canada". In spite of the increased attention given to the problem of improving the teaching of geography, there is still room for a tremendous improvement in the status of geography in Canadian schools. Today in parts of Canada neither geography nor social studies are being taught at either the grade school or high school level.

In the opinion of the Education Committee professional geographers have a very definite responsibility to the teacher and student of geography and therefore further action should be taken to put the case for geography before all education authorities in this country. As N.V. Scarfe, Dean of the Faculty of Education in the University of British Columbia, has put it, "The time has arrived for geographers to put their philosophy or point of view more clearly and forcibly before the ordinary public and particularly educators".[1] To this end a draft of a resolution on the teaching of geography was presented for discussion at the June 1956 meeting of the C.A.G.[2] A slightly revised version of the resolution is now presented for your further consideration, in the hope that constructive criticism will be forthcoming. It is the firm belief of the Education Committee that a resolution on the teaching of geography distributed to education authorities throughout Canada would greatly assist the advancement of the subject in grade schools and high schools.

The Resolution[3]

A resolution appears to be necessary:-

1. Because we believe that geography taught as a school subject has an essential contribution to make to the education of the grade school and high school child.

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[1] Report of the Commission on the Teaching of Geography in Schools, I.G.U. Commission Report, 1956.

[2] The editor wishes to acknowledge the contributions made by H.A. Wood, J.W. Hamilton and J.L. Robinson.

[3] In the writing of the resolution material was taken from Geography Teaching for International Understanding, UNESCO and its Programme VII, Publication 943, Paris 1951, and from Report of the Commission on the Teaching of Geography in Schools, I.G.U. Commission Report, 1956. There will be no further acknowledgement of this material.

2. Because there are still provinces of Canada where geography is not taught at any grade. In some provinces an attempt has been made to fuse geography with history and other social studies but too often geography loses its identity completely so that in effect geography is missing from the curriculum. Even where geography is included in the curriculum as a separate subject it is rarely obligatory to teach it to all grades between Grades IV and XII.

3. Because there is much evidence to suggest that geography is rarely a popular subject in schools, whereas in many countries of the world geography is an extremely popular school subject, e.g., in Britain, geography is the fourth matriculation subject and ranks ahead of history. The reasons for the unpopularity of geography are undoubtedly the lack of geographic training of the majority of teachers teaching the subject, and the inadequacy of teaching aids, though many excellent aids are available.

4. Because where geography is advocated it is usually thought of as mainly human geography. There are exceptions for in parts of Eastern Canada geography is taught separately and given some physical basis. In some other provinces physical geography is taught as a part of general science. Due to the emphasis placed upon human geography, geography becomes chiefly an account of how people live in the various regions of the world. Needless to say geography is rarely taught in a systematic and scientific manner.

5. Because geography is still thought of by many as a purely factual subject though, in general, Canadian administrators agree that geography is not a gazetteer of facts but rather a point of view and a group of ideas. Administrators agree that geography correlates physical and cultural conditions and yet they agree to the division of geography into social studies and earth science.

6. Because, - although geography is supposed to be taught for the purpose of helping future citizens think sanely about political and social conditions in the world and although administrators realize its value in fostering international understanding and a few, the value of geography in conservation and town and country planning, - very few teachers know how to teach geography so as to achieve these purposes.

7. Because in only a few teachers' colleges do students obtain any training in geography though courses are generally offered in methods of teaching social studies.

8. Because even though administrators realize the importance of the map to the geographer, the supply of topographical maps to Canadian schools depends largely on the initiative of individual teachers.

The Nature of Geography

Geographers study the world in order to show how the physical and human phenomena of its surface are related together in space and how variations in these relationships give rise to distinctive regions of landscapes which are the core of geographic study.

There follow a number of corollaries of this concept of geography:-

1. Geographic study must advance from the location of physical and human phenomena on the earth's surface to their description and explanation. Stagnation at the first stage of location results in the outmoded, "capes and bays" type geography. Mere memorization of the location of places or of lists of "phenomena" such as crops or minerals is not geography. Unfortunately it is often the only stage reached in the teaching of geography in many Canadian schools.

2. Since the phenomena of the earth's surface and their interrelations vary greatly from place to place it is not possible to conduct a true geographic study of the world as a whole, a continent or even a country without a subdivision into areas or regions which possess a certain uniformity or distinctiveness. We thus find that "regional geography" is a major method of geographic study. Regional geography enables the geographer not only to study convenient divisions of a continent but also to compare regions throughout the world. It is a major weakness of geography as taught in most schools in Canada that this regional approach is neglected and thus students are unable to grasp either the variations in the character of landscapes from place to place or the total character of the country which he is studying.

3. Rather than use the regional approach the geographer may centre his study on a single phenomenon or group of phenomena, e.g., climate, landforms, population distribution or economic production. These phenomena are then studied in their interrelations with other elements on the earth's surface. This method of approach is known as systematic geography and it is necessarily the initial stage in the study of a region if interrelationships are to be understood. Though systematic geography does appear in some curricula as general geography it is often divorced from regional studies. More time should be allotted to systematic study of both physical and human geography in grade schools and high schools. Physical geography in particular requires the systematic approach and if the study is carried out as direct observation or through pictures, air photos and maps,it is usually of great interest to children between the ages of 10 and 15.

4. Geography is not merely an agglomeration of parts of the systematic sciences. Whereas, the other sciences seek to isolate the elements of the earth's surface and study them apart from reality, geography seeks to unite these elements into a coherent whole. In so doing, as is true for all fields of knowledge, geography utilizes facts derived from other disciplines. The omission of geography from a programme of study is the omission of a vital realm of human understanding.

5. Geography is a dynamic subject for it studies dynamic landscapes. The geographer then must concern himself with the development of landscapes and present changes. Geography takes account of this dynamic nature of the total environment more so than any other science. It is essential then for administrators to realize that teachers and students must be kept supplied with current periodicals, revised editions of textbooks and wall maps, the most recently published topographical maps and only up-to-date teaching aids.

The Purpose of Geography

Specific aims. 1. To provide students with a knowledge of facts, concepts and relationships so that they may be able to visualize or imagine accurately the physical nature and characteristics of human occupance of regions the world over.

2. To provide a knowledge of, and the ability to use, specific tools by which information important to the geographer may be secured, viz., maps, globes, field work, models, pictures, films, air photos, statistical tables, texts, etc.

General objectives. 1. To develop, through an initial study of the student's own environment and subsequent comparison with other environments, an understanding of how the varied problems of peoples are related to differences in environment and to proceed from this understanding to an appreciation of the problems, achievements and possible future developments of other peoples.

2. To develop the power to appreciate the economic and cultural interdependence of regions and peoples.
3. To develop an understanding of the true nature and value of natural resources and of the need for an intelligent use of them.

The value of geography in education. Geography offers a unique integration of the school curriculum in its emphasis on man-land relations in specific places the world over.

Geography has the general educational function, common to all subjects, of training children to think critically and diligently for themselves and by themselves. It is therefore but one of several necessary subjects in a school curriculum that have common objectives, common approaches, and common methods of study, but distinctive contributions to make to total wisdom, and precise points of view to offer.

The mental challenge and the necessary emotional insight into human adjustments presented by geography is excellent educational training. Geographers support the theory that all education should help children face political and social problems sensibly.

Geography is the main means of co-ordinating and integrating the informational aspects of an educational programme which includes history and science, in the same way as craft work and architecture are excellent means of integrating mechanical skills and artistry in the field of practical education.

Geographers embrace fully all up-to-date and sensible ideas on methods of teaching, particularly the active experimental investigatory methods involving field work and close study of the real earth.

General Recommendations

Social studies. We are generally of the opinion that geography, because it is a subject with a distinct point of view, should be taught as a separate subject from at least Grade 3 or 4.

We consider that where geography is integrated or fused with other subjects it loses its identity and special function. Under the heading of social studies the attempt is made to fuse geography most often with history. Though there is a "universal and mutual relation" between these two subjects, they each have a distinct point of view, geography in terms of space and history in terms of periods of time.

To develop a complete understanding of the landscape the geographer requires some knowledge of historical development and likewise the historian must rely partly on geography to correctly interpret historical events. But the complete fusion of two different points of view is surely an impossibility. The forced marriage of geography and history in the Social Studies programmes of many Canadian schools makes it impossible for a teacher to present logically either history or geography unless, as is often done, he ignores one and teaches only the other, or unless he teaches them alternately. In either case the official union of the two subjects would appear to have no effect other than the confusion of the student and the teacher. When geography is taught within the social studies emphasis is usually placed upon relationships to the neglect of areas or landscapes. Geography is, above all, a study of the earth's surface.

Course content. In general, in the geography syllabi of Canadian school systems too much emphasis has been placed on a complete world regional coverage. The time available in school time-tables for the teaching of geography, whether it be taught within the social studies or separately, is short and definitely inadequate, so that teachers tend to neglect physical geography in particular, and concentrate rather on locational and economic geography which they treat very superficially.

Though all school programmes encompassing the grade school and high school period should aim at the development of a knowledge of world geography which is necessary, particularly to achieve the aim of international understanding, the emphasis should be placed on the development of a geographic "spirit" or "understanding" rather than on a factual knowledge of the geography of all countries or regions of the world. The development of geographic "concepts" is more likely to result from the detailed study of the student's home region, the student's own country and continent and typical sample communities or landscapes in other major geographic regions of the world, than it is from any attempt to study the geography of all regions or countries of the world. Any such attempt must surely result in the acquisition of only a superficial knowledge of world geography which may be sufficient to pass examinations but which will make little contribution to the achievement of the major objectives outlined above.

The importance of maps. Maps naturally fit into geography teaching for they make for precision and accuracy and help in the ultimate generalizations and in extending knowledge beyond the limits of the small sample area.

The kinds of maps that are most useful and illuminating in initial study are, however, those which represent small areas on large sheets of paper, such as the topographic maps on the scale of one inch to one mile or to the scale of 1:50,000. These sheets present areas comprehensible to children and show enough detail for them to be able to look through the map to the reality it depicts. Topographical maps in large quantities and at low cost are available for all of the settled parts of Canada. Teachers should be given every assistance in obtaining adequate supplies of topographical maps.

The geographical training of teachers. Many Canadian administrators agree that social studies is an integration of history and geography and yet only rarely are students in training given the opportunity of studying both subjects. Because of the past neglect of geography, students come to training colleges with very little knowledge of the subject and yet they are expected to learn and develop methods of teaching the subject either as geography in its own right or within the social studies.

We strongly recommend that students in training colleges be given the opportunity of studying geography so that they will be better prepared to teach either geography or social studies. A number of universities throughout Canada and the United States are now offering summer programmes in geography. We recommend that teachers now in service be given every encouragement to attend such courses. Because many of these courses involve field work they are preferable to winter night courses, though the latter may serve a very useful purpose.

Note: The Education Committee plans to add to the section 'General Recommendations' on the completion of research at present being carried out. The editor would be most grateful for any suggestions or constructive criticism of the resolution.

LES EFFETS DU DEVELOPPEMENT DE LA COTE NORD SUR LA VIE ECONOMIQUE DE LA RIVE SUD

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Le but de cette communication est de montrer l'influence réciproque des activités économiques de deux régions et comment l'incidence de nouveaux facteurs peut affecter la vie économique de l'une et de l'autre. Les deux régions choisies sont d'une part la Côte Nord de l'estuaire du Saint-Laurent et d'autre part la Rive Sud du Saint-Laurent. Essayons une délimitation plus précise. Pour faciliter l'accès aux statistiques, nous conviendrons que la Côte Nord correspond au comté de Saguenay, i.e. qu'en bordure de l'estuaire la région s'étend de Tadoussac à Blanc-Sablon. La Rive Sud est beaucoup moins étendue, et en longueur et en profondeur. Pour des raisons d'ordre statistique encore, nous incluons dans cette région les comtés municipaux de Rivière-du-Loup, Rimouski, Matane, Matapédia et Gaspé-Ouest.

Il s'agit donc de deux régions assez bien individualisées. Si elles ne se touchent en aucun point, elles ont toutefois entre elles un lien puissant, le Saint-Laurent. Leur économie est semblable à quelques points de vue. A l'Est de deux régions, la pêche joue un rôle important; à l'Ouest, c'est l'exploitation de la forêt. Mais les différences économiques sont nombreuses; nous aurons l'occasion de le constater au cours de l'exposé. Examinons d'abord brièvement de quelles façons s'effectue le développement actuel de la Côte Nord; il sera plus facile ensuite d'en saisir les répercussions sur la vie économique de la Rive Sud.

Avant la dernière guerre mondiale, la vie économique de la Côte Nord était axée sur deux activités principales. A l'Ouest de Sept-Iles, l'exploitation de la forêt; à l'Est, la pêche. Pendant la dernière guerre et durant les années suivantes, un renouveau s'est manifesté qui a porté principalement sur l'industrie du bois mais également sur l'utilisation partielle de l'énorme potentiel électrique des rivières de la Côte Nord ainsi que sur l'exploitation des richesses du sous-sol.

L'exploitation de la forêt sur la Côte Nord connaît depuis quelques années une expansion rapide. Plusieurs centres qui avaient végété pendant la crise des années 30 ont été réouverts depuis et continuent de nos jours à prendre de l'expansion. Tels sont Clarke City, Franquelin, Godbout, Rivière-Pentecôte. Baie-Comeau fait figure à part. Cette ville crée de toutes pièces en 1937 est le plus important centre de l'industrie du bois de la région. Au total, on estime qu'il se coupe annuellement sur la Côte Nord plus de 1,000,000 de cordes de bois. La plus grande partie de ce bois est expédiée en dehors de la région après n'y avoir subi que des traitements primaires: coupe, transport, écorchage. C'est pourquoi le rapport de la main-d'oeuvre flottante à la main-d'oeuvre permanente est très élevé et se maintient dans une proportion de cinq contre un, soit environ 10,000 contre 2,000. Ce n'est qu'à Baie-Comeau, où l'on produit du papier-journal, et à Clarke City, d'où sort de la pâte de bois, que l'industrie atteint un certain degré de perfectionnement technique.

Cet essor de l'industrie forestière n'a été rendu possible que grâce à la présence de ressources en énergie hydroélectrique. On sait que le potentiel de cette région est énorme. Betsiamites, Manicouagan, Moisie, Ste-Marguerite, Roamaine sont autant de rivières dont le potentiel dépasse respectivement le million de chevaux-vapeur. Seule jusqu'ici l'industrie du bois avait profité de ces ressources. Mais, maintenant, il semble qu'elles serviront également à d'autres développements. Dès cette année, on doit commencer la construction, à Baie-Comeau, d'une aluminerie qui tirera son énergie hydroélectrique de la Manicouagan. Il est possible qu'une

autre aluminerie soit construite ailleurs sur la Côte Nord, probablement à Sept-Iles. Notons enfin le projet en voie de réalisation sur la rivière Betsiamites, projet qui prévoit la production de 1,200,000 chevaux-vapeur. Cet aménagement n'est pas fait uniquement en vue des besoins de la Côte Nord mais également pour ceux de la région de Chibougmau, de Montréal et, comme nous le verrons plus loin, de la Rive Sud. Ici, comme ailleurs dans le Québec, les ressources hydroélectriques laissent donc présager de nombreux développements.

L'après-guerre a également signifié un essor nouveau de la région dans l'exploitation des richesses minières. Le développement spectaculaire des mines de fer de Schefferville est trop connu pour qu'il soit nécessaire d'y insister. Mais il n'est pas le seul. L'exploitation des gisements d'ilménite du lac Allard, près de Havre-Saint-Pierre, du sable ferrifère de la région de Natashquan, des gisements de mica de la région de Johan-Beetz sont autant de réalisations récentes dont l'incidence économique ne peut qu'être considérable.

Cette simple énumération permet de comprendre l'ampleur du développement qui s'effectue sur la Côte Nord. On peut aussi le constater par l'évolution numérique de la population. Au début du siècle, la région comptait environ 11,000 habitants. Jusqu'en 1941, elle augmente d'un peu moins de trois fois. Mais de 1941 à 1954, elle augmente d'à peu près le double, passant de 29,000 à 53,000. De nouvelles municipalités surgissent; huit depuis 1941, dont trois en 1951. Les villes se développent. Sept-Iles, qui n'avait que 1,866 habitants en 1951, dépasse maintenant 5,000. Baie-Comeau a maintenant atteint 4,500 tandis que Hauterive, créée de toutes pièces en 1950, comptait, à la fin de 1954, 1,225 personnes. L'augmentation est générale, principalement à l'Ouest de Sept-Iles.

Au total, il s'agit d'un essor remarquable et qui ne semble pas devoir s'arrêter. Cependant, malgré ces récentes réalisations, l'économie de la Côte Nord n'en reste pas moins fragile. Et surtout elle demeure tributaire de l'extérieur pour plusieurs activités économiques essentielles. Citons en particulier les faiblesses de son agriculture, l'insuffisance des voies de communication, la dispersion de la population et sa faiblesse numérique. Dans ces conditions, il apparaît que le développement d'une telle région ne peut se faire qu'avec l'apport de facteurs externes. Il y a donc transfert de forces économiques d'une région à une autre. Cet échange se fait avec plusieurs régions mais en particulier avec la Rive Sud. Voyons de quelles façons les choses se passent.

D'abord essayons de résumer les principaux traits de la vie économique de la Rive Sud. A la base, une agriculture peu modernisée et qui souffre d'un manque de marché. Autres activités importantes, les industries dépendant du bois: abatage, scieries, manufactures de meubles, de portes et châssis. La vie commerciale est active parce que très souvent elle a une origine locale. Les grandes villes sont peu nombreuses. Rimouski, la plus importante, ne vient que de dépasser 15,000 habitants. Rivière-du-Loup, Matane et Mont-Joli se situent entre cinq et 10,000 habitants. Cependant, au total, le chiffre de la population est assez élevé. En 1941, il était de 143,000; de 170,000 en 1951 et atteignait presque 180,000 en 1954 (ces chiffres s'appliquent aux cinq xomtés énumérés plus haut). Toutefois, il s'agit là d'une population dispersée et en grande partie rurale. Comme le taux d'accroissement naturel est élevé, il existe depuis longtemps dans cette région un surplus de main-d'oeuvre que la colonisation ou l'apparition de nouvelles industries n'ont jamais pu absorber complètement. Cette région ne connaît donc pas la grande activité économique que l'on remarque plus au sud de la province.

Mais on ne peut pas dire que l'économie de la Rive Sud a atteint un point de stagnation. L'impulsion lui vient en grande partie de l'influence du développement économique de la Côte Nord. Cette action se manifeste de plusieurs façons. Essayons d'en retracer les principales.

Depuis quelques années, la Côte Nord constitue un excellent débouché pour les surplus de main-d'oeuvre de la Rive Sud. Le phénomène n'est pas propre à ces deux régions; il se rencontre à plusieurs endroits dans la province de Québec. L'exploitation forestière sur la Côte Nord demande une nombreuse main-d'oeuvre temporaire, principalement pour l'abatage durant l'hiver. D'autre part, cette période de travail convient très bien à l'agriculteur de la Rive Sud pour qui l'hiver est une saison morte en ce qui concerne les travaux de la ferme. De plus, les principales scieries de la Rive Sud n'opèrent en général que de mai à novembre; les travailleurs se trouvent donc en face d'une autre période creuse où ils ont le choix de s'embaucher ou bien dans les chantiers de la Rive Sud ou bien dans ceux de la Côte Nord. On estime qu'il y a ainsi de neuf à 10,000 personnes qui, chaque année, quittent la Rive Sud pour une période plus ou moins prolongée afin d'aller travailler dans les chantiers de la Côte Nord. Ceci ne comprend pas évidemment le travailleur qui s'est établi en permanence dans cette région, soit à Baie-Comeau, Sept-Iles, ou autres endroits. Il est donc clair que l'essor de l'industrie forestière sur la Côte Nord a aidé considérablement à atténuer le problème du surplus de main-d'oeuvre dans cette région.

Mais cette influence ne se limite pas qu'à l'industrie du bois. Le développement de la Côte Nord est aussi marqué par d'autres réalisations. Sans parler des travaux publics (construction de routes, d'édifices publiques et autres), on peut mentionner la construction des barrages comme celui de la Betsiamites, du chemin de fer Sept-Iles-Schefferville, de la construction prochaine de l'aluminerie de Baie-Comeau. Signalons également les occasions d'emploi créées par l'ouverture des mines à Schefferville, lac Allard. Il est difficile d'évaluer d'une façon précise jusqu'à quel point ces développements récents ont été réalisés avec l'aide d'une main-d'oeuvre venant de la Rive Sud; mais on peut supposer, sans crainte de se tromper, que cette proportion est assez importante, vu d'une part la proximité des deux régions et, d'autre part, les disponibilités de la Rive Sud dans ce domaine.

Le secteur agricole est également touché dans ce développement. Les rugueurs du climat et les conditions topographiques font que, sur la Côte Nord, l'agriculture n'est pratiquée que sur une très faible échelle et est localisée presqu'exclusivement entre Tadoussac et Sept-Iles. Inutile de dire que les récoltes sont tout à fait insuffisantes et en qualité et en quantité. Depuis de nombreuses années, la Rive Sud assume la tâche de compenser en partie pour ces déficiences. En partie seulement, parce que l'agriculture de la Rive Sud elle-même n'est pas en mesure de subvenir aux besoins de la région. Des villes comme Rimouski doivent importer des régions de Québec et même Montréal des produits qui ne peuvent pousser ou que personne n'a encore eu l'initiative de cultiver dans la région. Les cultures maraîchères sont absentes même autour des villes.

Toutefois, dans plusieurs domaines, la Côte Nord constitue pour la Rive Sud un marché excellent. Les grains, les fourrages y sont expédiés chaque année par bateaux. Le bétail de boucherie tient aussi une bonne part. Rimouski est doté d'un abattoir coopératif qui compte la Côte Nord comme l'un de ses débouchés. L'action des coopératives agricoles tend aussi à augmenter les échanges. Depuis quelque temps, les autorités locales concernées (agronomes, dirigeants de coopératives) tentent d'intéresser le plus possible les agriculteurs à ce marché qui ne fait que s'accroître. Signalons également une heureuse politique du gouvernement provincial, celle d'accorder des subsides au transport du lait par avions vers la Côte Nord. Ces subsides servent à absorber une partie des coûts de transport et permettent la mise sur le marché à un prix qui reste concurrentiel. En conséquence, l'industrie laitière de la Rive Sud peut accéder au marché de la Côte Nord dans des conditions plus favorables. Le transport se fait des aéroports de Matane, Mont-Joli et Rimouski et on estime que la livraison quotidienne est d'environ 2,000 livres de lait.

Ces faits montrent bien toute l'importance que peut prendre la Côte Nord comme débouché pour les produits agricoles de la Rive Sud. Et il est certain que ce

marché n'a pas encore été exploité selon toute sa valeur. La situation respective des deux régions, les conditions géographiques qui prédominent dans l'une et l'autre permettent d'affirmer que, dans ce domaine, les échanges devraient être plus nombreux. Et le développement actuel de la Côte Nord rend ces échanges souhaitables sinon nécessaires. L'intégration de ces deux régions, du point de vue agricole, ne peut que donner un regain de vigueur à l'agriculture de la Rive Sud qui a longtemps souffert d'un manque de marché adéquat.

Ces considérations peuvent s'appliquer, dans une certaine mesure, aux activités commerciales de la Rive Sud. Celle-ce, à cause de son isolement, a dû édifier ses propres structures commerciales qui se sont constituées en même temps que se développait la région. Autrefois adaptée à l'échelle du village, la vie commerciale a pris, aujourd'hui, un essor rapide dans certaines villes favorisées par leur situation. C'est ainsi que Rivière-du-Loup, Rimouski et Matane sont devenus des centres commerciaux d'importance. Toutefois, à cause de leur position en bordure du fleuve et des facilités de communication vers l'autre rive, Matane et Rimouski peuvent également participer d'une façon active à la vie commerciale de la Côte Nord. Cette intrusion était d'ailleurs facilitée par le manque d'organisation le long de la Côte Nord et la nécessité où l'on se trouvait de faire appel à l'extérieur. L'occasion n'a pas été délaissée par les commerçants de la Rive Sud qui ont très bien compris leurs avantages. Aujourd'hui on peut dire que le commerce de gros et de détail se fait en grande partie à partir de Matane et surtout de Rimouski. Même si Baie-Comeau est relié à Québec par une route, il est plus rapide, comme voie commerciale, d'utiliser le fleuve, de la Rive Sud vers la Côte Nord.

De même que pour l'agriculture, le commerce fournit donc une autre occasion à l'integration des deux régions. Il est difficile d'évaluer toute la portée de ce mouvement. Toutefois, il est certain que l'augmentation très rapide des besoins de la Côte Nord en produits de toutes sortes influence heureusement les activités commerciales de la Rive Sud. Et il est à prévoir que ce mouvement ne fera que s'accentuer.

Enfin, le développement de la Côte Nord a suscité de multiples activités sur la Rive Sud. A mesure que se faisait l'humanisation de la Côte Nord il fallait organiser les moyens d'accès. Le fleuve a longtemps été la voie principale et encore de nos jours il reste un des facteurs prédominants dans les communications avec la Côte Nord. Dans ce secteur du fleuve, le cabotage joue donc un rôle primordiale. Il se pratique de deux façons. Parfois il ne s'agit que de simples goélettes qui se déplacent sans itinéraire fixe; c'est la réplique du "tramp". Parfois il est organisé en lignes régulières avec horaires plus ou moins fixes. Les principaux points de départ sont Rimouski, Matane et Ste-Anne-des-Monts. De là, on peut atteindre tous les principaux points de la Côte Nord. La présence de cette dernière a donc permis à l'activité maritime de se maintenir d'une façon intense sur la Rive Sud, malgré la concurrence des moyens de transport plus modernes.

Et ici nous voulons parler spécialement de l'avion qui joue un rôle de plus en plus important, surtout durant l'hiver. Plusieurs des lignes se dirigent vers la Rive Sud, principalement Mont-Joli et Rimouski. Plusieurs compagnies se sont organisées afin de profiter des échanges croissants entre les deux régions. Des aéroports modernes sont construits afin de répondre à ces nouveaux besoins. En sorte que, aujourd'hui, les progrès dans ce domaine ont atteint un point remarquable grâce surtout à la nécessité d'effectuer des échanges avec la Côte Nord. Nous avons signalé plus haut les expéditions de lait. Cet item ne vient que s'ajouter à un traffic déjà intense: livraison du courrier, transport de la main-d'oeuvre, des prospecteurs, etc.

On a beaucoup parlé depuis quelques années d'un projet qui est maintenant passé au stade de la réalisation. Il s'agit des cables sous-marins posés sur le lit du Saint-Laurent afin de transporter l'électricité de la Côte Nord vers la Rive Sud. Ce

projet est né de la conjonction de plusieurs facteurs économiques, parmi lesquels on peut nommer les faibles ressources de la Rive Sud en énergie hydroélectrique en regard du potentiel énorme de la Côte Nord; la construction de la centrale de Betsiamites; le désir d'exploiter les riches gisements cupirifères de l'intérieur de la péninsule. Ce dernier facteur semble avoir été l'élément décisif qui a déclanché ou du moins qui en a motivé l'exécution. De toutes façons, il en est résulté un afflux considérable d'énergie hydroélectrique: 100,000 chevaux-vapeur au début, devant être porté plus tard à 300,000. Cette contribution place la Rive Sud dans une meilleure situation au point de vue des ressources en énergie. Les répercussions ne devraient pas tarder à se manifester. Déjà l'exploitation des gisements miniers de l'intérieur de la Gaspésie a transformé cette région: fondation d'une ville, construction de routes, d'un port de chargement (Mont-Louis), etc. Il semble bien que ce ne soit qu'un point de départ.

Ce bref examen d'ensemble nous a permis de constater les relations très étroites qui règlent la vie économique de ces deux régions, que les développements de la Côte Nord ont des répercussions importantes sur la Rive Sud à cause de l'interdépendance entre ces deux régions. On pourrait même parler de complémentarité. L'une déborde de main-d'oeuvre tandis que l'autre en a un besoin croissant; l'une régorge de ressources hydroélectriques tandis que l'autre en recherche désespérément; l'une s'appuie sur de vieux cadres économiques tandis que l'autre est encore à la recherche d'un modus vivendi qui lui assurerait la stabilité. Dans de telles conditions, il semble logique que tout développement effectué sur la Côte Nord ne soit marqué par une recrudescence de l'activité économique sur la Rive Sud. Pendant longtemps, cette dernière a été isolée dans ce secteur de la province; l'éloignement ou le manque de débouchés ont fait que la région s'est repliée sur elle-même dans sa vie économique. Aujourd'hui, les développements de la Côte Nord permettent une reprise des activités à un échelon plus vaste. L'essor de Baie-Comeau, de Sept-Iles, de Schefferville ne peut que favoriser celui de la Rive Sud.

THE ELLESMERE ICE SHELF AND THE ICE ISLANDS [1]

G. Hattersley-Smith

Defence Research Board of Canada

Comparison of the accounts of the few earlier travellers with the modern air photographs of the north coast of Ellesmere Island suggests that, 50 and 80 years ago, the ice shelf along this coast may have been more extensive. It is believed that disintegration of the ice shelf in recent decades can be correlated with the occurrence of ice islands in the Arctic Ocean and in the channels of the Canadian Archipelago.[2] It is of particular interest to decide the source of origin of the larger ice islands and especially of T3, where important glaciological and other work has been carried on since 1952.[3]

While it is certain from a study of the air photographs that the Ellesmere Ice Shelf has calved ice islands in recent years,[4] there is no photographic proof that T3 originated in this way. Rock material, collected from T3, was almost entirely derived from feldspathic gneisses, hornblende schists and biotite schists.[5] The literature indicates four possible areas where such high-grade metamorphic rocks could have originated, namely Spitsbergen, north-east Greenland, northern Ellesmere Island, and Severnaya Zemlya, all regions where more or less extensive ice cover occurs at the present time. Further petrological considerations suggest that the Yelverton Bay and Cape Bourne areas of the north coast of Ellesmere Island are the most likely sources of T3.[6]

The ice drifts and surface currents in the Arctic Ocean are shown in Figure 1. Zubov sees two basic systems of ice movement in the central part of the Arctic Ocean. "One of these involves the influx of ice from the Arctic Basin into the Greenland Sea, and is due to the shore run-off, to the inflow of water from the Norwegian Sea, driven by south-west winds, and to the transport of water and ice from the Arctic Basin into the Greenland Sea by the north-east winds which prevail along the eastern coast of Greenland. The other system is an anticyclonic (clockwise) eddy with its centre at approximately 82° N. and 120° W. This eddy is due to winds connected with the high pressure area over the Canadian Archipelago".[7] The two

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[1] This is based on an address given at the January 1957 meeting of the Southern Ontario Division of the Canadian Association of Geographers in Hamilton, Ontario. It is published by permission of the Chairman, Defence Research Board of Canada.

[2] Koenig, L.S., R.R. Greenaway, Moira Dunbar and G. Hattersley-Smith: "Arctic Ice Islands", Arctic, 5, 1952, pp.67-103.

[3] Crary, A.P., R.D. Cotell, T.F. Sexton, R.R. Shorey and D. Goldstein, Scientific reports of GRD at Fletcher's ice island, T3, Cambridge, Mass., Air Force Research Center, 1952-55 (unpublished).

[4] Koenig et al: op. cit., pp.76-77.

[5] Stoiber, R.E., J.B. Lyons, W.T. Elberty and R.H. McCrehan: The source area and age of Ice island T3, Dartmouth College, N.H., 1956, p.14.

[6] Stoiber et al., op. cit., p.17.

[7] Zubov, N.N.: "Arctic ice islands and how they drift", Defence Research Board of Canada. Translation 176R by E.R. Hope from Priroda, 2, 1955, pp. 37-45.

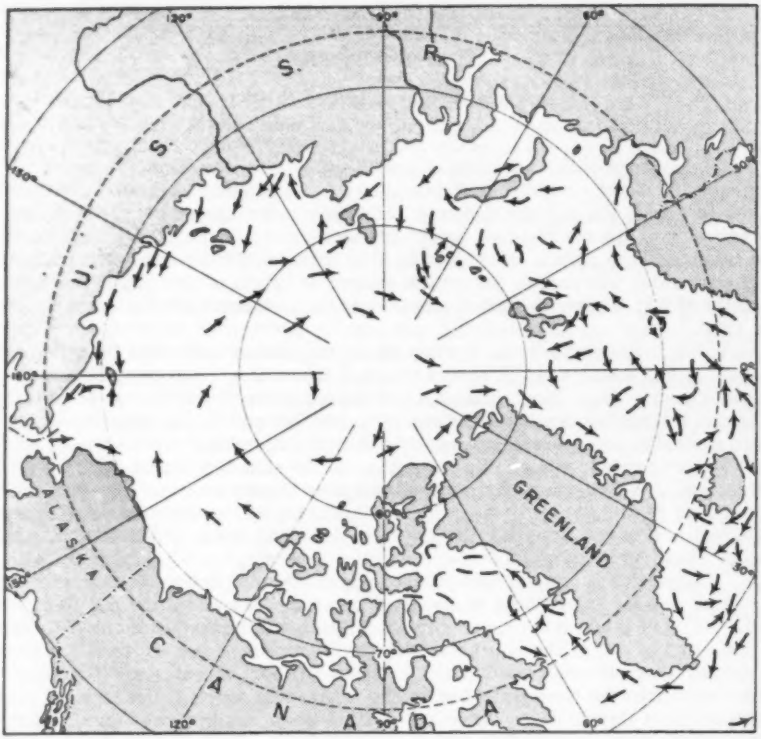

Figure 1. Ice drifts and surface currents in the Arctic Ocean.

systems characterize respectively the Atlantic and the Pacific sectors of the Arctic Ocean, which are separated by the submerged Lomonosov Range, as shown by recent work by Russia [1] and the United States of America. [2]

Zubov's observations, which are apparently well substantiated, suggest that ice originating off north-east Greenland or Spitsbergen is unlikely to move across to

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[1] "New Soviet researches, explorations and discoveries in the central Arctic", Defence Research Board of Canada Translation 165R by E.R. Hope from 1ZV. Akad. Nauk, Ser. Geog., 5, 1954, pp. 3-16; Webster, C.J.: "The Soviet expedition to the Central Arctic, 1954", Arctic, 7, 1954, pp. 59-80; "The Soviet high latitude arctic air expedition and drifting stations in the Arctic Ocean, 1954", Polar Record, 7, 1955, pp. 396-99.

[2] Metcalfe, W.G.: A note on arctic oceanography and the Lomonosov Range", Arctic, 7, 1954, pp. 108-109.

the sector of the Arctic Ocean north of the Beaufort Sea, where T3 has drifted. [1] For these reasons alone it seems improbable that T3 originated from north-east Greenland, where ice shelf is known to occur [2] or from Spitsbergen. It is inferred that T3 and the other ice islands, observed in the Pacific sector north of Canada, Alaska, and eastern Siberia, had their origin there.

The drift track of T3 (Figure 2) has been plotted since its discovery in April 1947, when it lay 30 miles north of Isachsen Peninsula, Ellef Ringnes Island; [3] at the end of September 1955 it lay about 100 miles north-north-west of Cape Stallworthy, the northernmost point of Axel Heiberg Island [4]. During eight years T3 has described an almost complete circuit, which has taken it first south-westwards in the direction of Point Barrow; thence roughly northwards over the North Pole, and in a continuing clockwise arc towards the north coast of Ellesmere Island; then south-westwards again on a course roughly parallel to the coastline. The orbit of its drift would in itself seem to be strong evidence that T3 originated from the Ellesmere Ice Shelf.

Severnaya Zemlya is a possible source area for some of the smaller ice islands. In Severnaya Zemlya large glaciers, descending from the ice cap, reach tide-water and merge with old bay ice of considerable thickness in some of the fiords [5]. But the larger ice islands, such as T1 (15 by 18 miles), T2 (17 by 18 miles), or T3 (4-1/4 by 9miles), are too big to have originated from one of the fiords of Severnaya Zemlya. It is significant that Zubov [6] does not mention ice shelf as occurring off the outer shores of Severnaya Zemlya or of any of the other Russian arctic islands; he tacitly accepts the view that T1, T2, and T3 originated from the Ellesmere Ice Shelf.

When the evidence of T3's drift is allied to the observed similarities in structure, thickness, surface pattern and provenance of associated rock material between T3 and the ice shelf, there can no longer be any reasonable doubt on the origin of T3 and little doubt on the origin of the larger ice islands whose drift tracks have been plotted.

Of the possible parts of the northern Ellesmere coast, from which the larger ice islands may have stemmed, Yelverton Bay is perhaps the most likely from the accounts of Aldrick and Peary, who reported what was apparently ice shelf in the bay [7], contrasted with recent air photographs, which show small ice islands frozen into the bay ice or drifting with the pack ice outside Yelverton Bay. Rock material found on T3 might well have originated from the shores of Yelverton Bay, and the glacier ice on T3 [8] might have come from one of the glaciers which reach tide-water in this fiord.

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[1] Koenig et al.: op. cit., pp.69.

[2] Koch, J.P. and A. Wegener: "Die glaciologischen beobachtungen der Danmark-Expedition. Danmark-ekspeditionen til Grønlands nordøstkyst, 1906-1908", Medd. om Grøn., 46, 1917, p. 7; Helk, J.V. and Moira Dunbar: "Ice islands: evidence from north Greenland", Arctic, 6, 1953, pp.263-271.

[3] Koenig et al., op. cit., p.75; Wood, W.A.: "Discovery of T3", Polar Record, 8, 1956, p.66.

[4] Crary et al., op. cit.

[5] Dibner, N.B.: "The origin of the floating ice islands", Defence Research Board of Canada Translation 176R by E.R. Hope from Priroda, 3, 1955, pp.11-14.

[6] Zubov, op. cit.

[7] Koenig et al., op. cit., p.92-94.

[8] Crary, A.P. and R.D. Cotell: "Ice islands in arctic research", Scientific Monthly, 75, 1952, p.302.

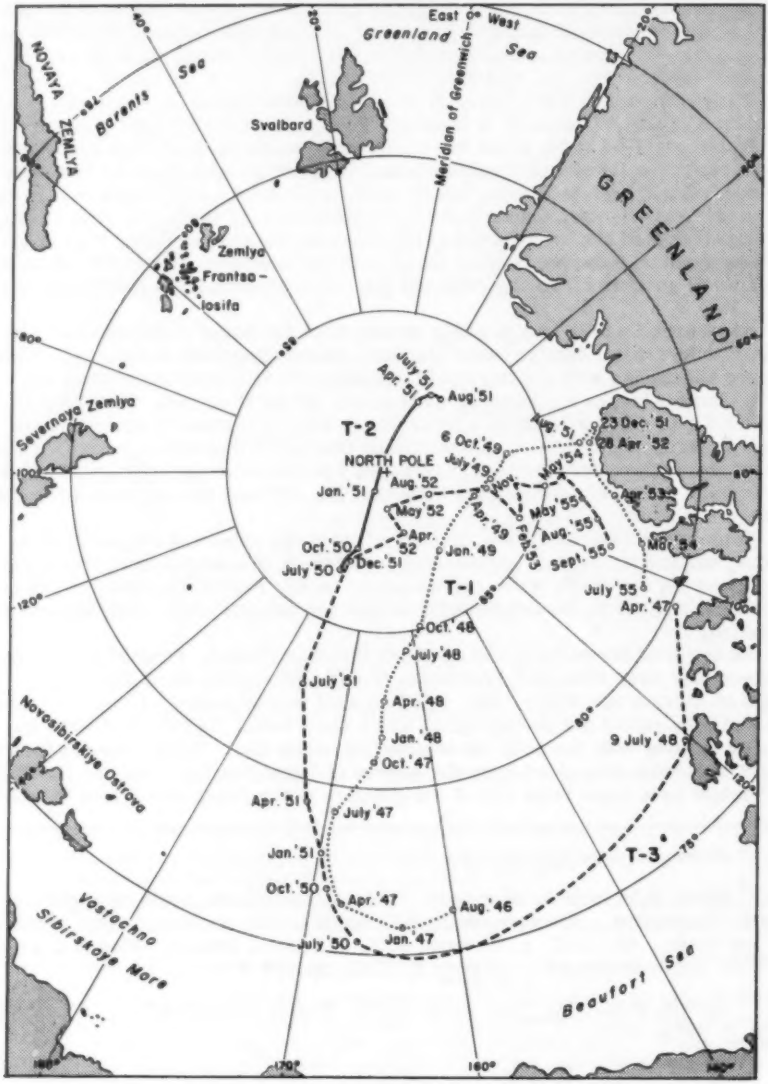

Figure 2. Approximate paths of T1, T2 and T3.

Plant material still living on T3 indicates recent connexion with land.[1] From dendrochronological studies of arctic willow, collected dead from T3 and living from northern Ellesmere Island, it has been very tentatively suggested that T3 broke away from the coast after the summer of 1935.[2] It is interesting to note that the recent marine warming is said to have reached its maximum during the middle 1930's.[3] At the present time long cracks, running obliquely to the line of the ridge and troughs of the ice shelf, are visible in Ayles Bay, Milne Bay, and on the main development of the ice shelf a few miles north of Cape Discovery; they may mark lines of break-off of future ice islands.

Some reference is necessary to two possible deviations from the apparently typical drift orbit of the ice islands, described above. First, some ice islands might escape the northerly drift in the region between Alaska and the North Pole, and travel across to the area of the drifts of the "Jeannette",[4] "Fram", and "Karluk"; they would then follow a course north of Franz Josef Land and Spitsbergen to the Greenland Sea. The possibility that large tabular icebergs, observed in Spitsbergen waters in the 1880's and 1920's, may have drifted from the Pacific sector of the Arctic Ocean has been discussed by Sandford.[5] Secondly, an ice island, after passing near the region of the North Pole in its clockwise drift, might become involved in the general drift towards the Greenland Sea under special meteorological conditions prevailing when it is in a critical position north of Peary Land. Thus the predicted position of T2 early in 1954 lay far down the east coast of Greenland,[6] where in Kong Oscars Fjord a large ice island was sighted from M.S. "Kista Dan" in September 1955.[7] Possibly the same ice island was sighted off the south-west tip of Greenland near Frederiksdal in September 1956.[8]

Ablation measurements on T3[9] suggest that ice islands, unless diverted from their typical drift track, may persist for many years, and that Sverdrup's 40-60

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[1] Polunin, N.: "Long distance plant dispersal in the north polar regions", Nature, 176, pp.22-24.

[2] Polunin, N.: "Attempted dendrochronological dating of ice island T3", Science, 122, p.1185.

[3] Dunbar, M.J.: Eastern arctic waters, Fisheries Research Board Can. Bull., 88, 1951, p.105.

[4] Koenig et al.: op. cit., p.95.

[5] Sandford, K.S.: "Tabular icebergs between Spitzbergen and Franz Josef Land", Geog. Jour., 121, 1955, pp.164-170.

[6] Crary, A.P. and Irene Browne: Probable ice island locations in the Arctic Basin, January 1954, Cambridge, Mass., Air Force Res. Center, 1954.

[7] Lauritzen, K.: "Ice islands off East Greenland", Polar Record, 8, 1956, p.46.

[8] Lauritzen, K.: Personal communication, 1956.

[9] Crary et al., op. cit., 1952-1955.

year estimate of their life, based on the amount of summer melting on sea ice off Siberia,[1] is too short. "No tabular berg of the Antarctic, composed mainly of consolidated snow, could ever survive the buffets of years in the Arctic pack ice".[2] Their formation from ice firn and sea ice[3] gives the ice islands their durability.

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[1] Sverdrup, H.U.: "Some problems in arctic meteorology", Proc. Toronto Met. Conf., 1954, p.73.

[2] Debenham, F.: "The ice islands of the Arctic: a hypothesis", Geog. Rev., 44, 1954, p.495.

[3] Marshall, E.W.: "Structural and stratigraphic studies of the northern Ellesmere ice shelf", Arctic, 8, 1955, pp.109-114.

UNIVERSITY NEWS

Alberta

As of April 1957, geography will be a separate department in the university, with Dr. William C. Wonders as head. The latter presented papers on the urban geography of Edmonton at the Montreal meetings of the A.A.G. and of the C.A.G., and during the summer of 1956 lectured at Royal Military College, Kingston, Ontario. He has been preparing the Edmonton maps for the National Atlas during the present academic year.

Professor A.H. Laycock lectured at summer session 1956, and continued his research into studies of moisture deficiency and surplus patterns in the prairie provinces. During the academic year this study has continued, with the support of the Prairie Provinces Water Board, with as many as 15 students working part-time under Professor Laycock.

Visiting Professor at the 1956 summer session was Dr. T. McKnight of the University of California at Los Angeles. Dr. D.F. Putnam, of the University of Toronto, will be visiting professor for the 1957 summer session.

The first degrees in geography at the University of Alberta will be awarded to graduating students this May.

British Columbia

The publication of the "British Columbia Atlas of Resources" in the fall of 1956 brought to completion over two years of intensive work and close collaboration among specialists drawn from the University, Government, and Industry. Professor John D. Chapman served as one of the two editors and Richard I. Ruggles as one of the two cartographic editors. Both staff members contributed to the session on the "Use and Value of Maps" at the Tenth Annual Meeting of the B.C. Resources Conference of which Professor Chapman was President.

Dr. J. Lewis Robinson gave his presidential address on "Geography and Regional Planning" to the Canadian Association of Geographers and later attended the meetings of the International Geographical Union at Rio de Janeiro. During the academic year of 1956-57, Dr. Robinson was on leave of absence to lecture on the Geography of Canada at the University of Rochester's Canadian Studies Program. Dr. E.C. Mather, from the University of Georgia, came to U.B.C. for one year as visiting professor during Dr. Robinson's absence.

Dr. J. Ross Mackay served as visiting professor at the University of Washington during the Spring Quarter of 1956. In collaboration with Dr. W.H. Mathews, a geologist, Dr. Mackay did field work in the late summer of 1956 on an archaeological site in the Arctic under a research grant from the Arctic Institute of North America. Dr. Mackay has completed several articles and a memoir for the Geographical Branch, the work being based upon four field seasons in the Arctic under the auspices of the Geographical Branch.

Dr. Donald P. Kerr joined the staff in the fall of 1956. His joint publication with W.G. Kendrew on "The Climate of British Columbia and the Yukon Territory" has recently been published by the Meteorological Division, Department of Transport. Dean N.V. Scarfe, formerly Director, Department of Geography, Institute of Education, University of London, has been appointed Dean of the College of Education. Dean Scarfe attended the meetings of the International Geographical Union at Rio de Janeiro.

The 1956 Summer School was one of the largest on record. Enrolments in Geography Courses exceeded 300.

Carleton College

Three courses in geography are being offered during 1956-57 in the evening division. They are The Geography of Canada, General Geography and Economic Geography, and are being given by Dr. N.L. Nicholson, Alan Cureton and Burt Kelso, respectively.

Laval

M. Louis-Edmond Hamelin, directeur de l'Institut, a assisté au congrès de Rio comme membre de la délégation canadienne. Il s'est ensuite dirigé vers la France où il poursuit ses recherches au Laboratoire de Sédimentologie de la Faculté des Sciences et à l'Institut de géographie de Paris. Il visite également les Instituts de géographie français et a déjà prononcé quelques conférences.

M. Pierre Camu enseigne maintenant à Laval et il est chargé de cours de géographie économique. M. Camu a été invité à prononcer trois conférences au Département de géographie de l'Université de Toronto au début de novembre 1956.

Les autres membres du personnel de l'Institut sont: M. Fernand Grenier, secrétaire; M. Robert Bergeron, chargé des cours de géologie; M. G.-Oscar Villeneuve, chargé des cours de climatologie et M. Louis Trotier, assistant.

Au cours du premier semestre, l'Institut avait invité M. François Taillefer, directeur de l'Institut de géographie de Toulouse, qui a donné un cours de morphologie, un cours sur l'Afrique de Nord et dirigé des laboratoires.

L'Institut a également reçu au cours de l'année d'autres professeurs qui ont donné des séries de cours: M. André Journeaux, de Caen, en morphologie climatique; M. Jean Gottman, sur les villes américaines; M. Karl G. Trotsig, de l'Institut de géographie économique de Stockholm, sur l'économie suédoise et M. Jacques Rousseau, directeur du Musée canadien de l'homme, sur des problèmes de géographie de l'Arctique.

Depuis octobre 1956, l'Institut publie une revue périodique, les Cahiers de géographie de Québec, dont il paraît deux numéros durant l'année académique, en octobre et en avril.

Un groupe de 27 étudiants en géographie et professeurs de Laval a été reçu en novembre 1956 par le Département de géographie de l'Université de Toronto. Il y eut excursions dans les régions de Toronto, Hamilton et Niagara.

Les Cours d'été de 1956 ont rassemblé une quarantaine d'étudiants, tous professeurs de géographie dans l'enseignement supérieur et secondaire.

M. Pierre Biays, de Besançon, et M. Ludger Beauregard sont les professeurs invités pour les Cours d'été de 1957.

Manitoba

The Department of Geography now includes, in addition to Professor T.R. Weir, Assistant Professor William Parker and Lecturer Boyd Barty. Professor Parker came to the University of Manitoba from Hamilton College of McMaster University in September 1956. He anticipates the presentation to the University of Oxford of his doctoral dissertation in the summer of 1957. He instructs in Introductory Geography, Economic Geography and the geography of Europe and the Soviet Union. Boyd Barty received his M.A. degree from the University of Edinburgh. He assists in the teaching of Introductory Geography, Climatology and Cartography and has also done much to activate interest in the students' Geography Club.

The Department continues to sponsor the Manitoba Geographical Society. The average attendance at their meetings has been eighty.

During the summer of 1956, Professor Weir attended the 18th International Geographical Congress in Rio de Janeiro, Brazil, as a member of the Canadian delegation. He presented a paper entitled "Land Use and Day-Time Population in Winnipeg". After spending 26 days in Brazil he spent two weeks in Peru and Ecuador before returning to Canada.

McGill

The department continued its graduate programme in the fields of northern studies, planning and historical geography. Twenty-nine graduate students were registered in 1956-57, of whom 19 were in residence, and five were at Knob Lake. Undergraduate enrolment was well maintained.

Professor F.K. Hare was appointed by the British Council under the Commonwealth Exchange Scheme to the University of London, Edinburgh and Liverpool for the summer term, 1956. He attended the NATO symposium on the Arctic Atmosphere in Oslo in July, and also visited the Universities of Stockholm and Zurich. He was elected a Councillor of the Association of American Geographers. Professor Hare also served as an invited expert to the Commission for Climatology, World Meteorological Organization, at its second session, January, 1957. He continued to serve on that Organization's Working Group on Climatic Atlases, which is setting up specifications for World Climatic Atlas. He was elected chairman of the Working Group on Derived Climatic Parameters.

Professor B. Zaborski represented McGill at the International Geographical Congress at Rio de Janeiro, and travelled very widely through Latin America before and after the Congress.

Professor Theo Hills, who also attended the Congress, continued his studies of livestock ranching regions of the world by carrying out a traverse of the Campos regions of Rio Grande do Sul, Goiaz and the southern Mato Grosso. He has been appointed to the Commission on the Humid Tropics of the International Geographical Union.

Professor J.B. Bird, accompanied by Research Associate M. Marsden, extended his work on continental Arctic Canada for the Geographical Branch in the Contwoyto Lake area, also making a preliminary survey of Back River, N.W.T. The first of two high school texts edited by Professor Bird has appeared; his subject was physical geography with special reference to Canada. Three full-time research staff - Miss A.M. Kroger, Mrs. J.P. Johnson and Dr. Max Bronhofer - under Professor Bird's direction continued their investigations into the physiography of Arctic Canada, with the support of the RAND Corporation. Two large reports covering 500,000 square miles of Arctic Canada have recently appeared.

Professor G.C. Merrill completed the requirements for the Ph.D. of the University of California having worked on the historical geography of St.Kitts and Nevis, B.W.I., under the direction of Professor C.O. Sauer. He served during the year as administrative officer of the Knob Lake projects, and was also secretary (and the real presiding genius) of the A.A.G. convention in Montreal. The department was host in April, 1956, to the Association of American Geographers for its annual meeting (with the Université de Montréal); 479 members attended.

Professor W.F. Summers continued his work during the field season as director of a land classification and land use programme being undertaken for the Government of Newfoundland, also serving as adviser to the Commission appointed to investigate economic conditions on the South Coast of Newfoundland. He was elected President of the Geographical Association of Montreal, and completed his doctoral thesis entitled "An Analysis of Population Trends in Newfoundland".

The McGill Sub-Arctic Research Laboratory at Knob Lake (Schefferville) continued to play an important rôle in the department's work. Professor R.N. Drummond will retire at the end of this session as director, his place being taken by Professor J.D. Ives. Full-time Research Assistants in residence in 1956-57 include Ivan Hamilton (Belfast), Bill Huard (Ottawa), Alan Cooke (Dartmouth), Graham Humphrys (Bristol), Kenneth Jones (University College, London) and Edward Derbyshire (U. of N. Staffs.). A new project to study the radiative and moisture characteristics of the vegetation types (aided by Defence Research Board) was begun by Research Associate Dr. Svenn Orvig, assisted by Walter Nebiker, Jr., and Kay Allington.

The Arctic Meteorology Research Group, under Dr. F.K. Hare, continued its studies of the arctic atmosphere. Attention was directed at statistical methods of analysis, and at synoptic models. Dr. Svenn Orvig, formerly Director of the Montreal Office of the Arctic Institute, joined the staff as Research Associate in charge of research. Dr. Mariano A. Estoque, formerly of the Philippine Republic, joined the group to apply graphical and numerical analysis to the arctic circulation. Dr. A.D. Belmont received his Ph.D. for his work on inversions at Ice Island T-3. This work is financed by the U.S. Air Force Cambridge Research Center. Several reports were published during the year.

The department has a contract with Defence Research Board to carry out glacial meteorological work in Ellesmere Island, under the International Geophysical Year Programme. This work will be directed by Dr. Svenn Orvig. It will involve (i) a four months' programme on the ice-cap in the summer of 1957, to be carried out by J.R. Lotz, under the leadership of G. Hattersley-Smith, of D.R.B., and (ii) the maintenance of a permanent station at Hazen Lake for 14 months, to be staffed by four graduate assistants.

McMaster

The Department has at present 22 students enrolled in the Honours Geography course and three graduate students. Theses of students graduating in 1957 include studies of Amabel Township, the Town of Burlington and the Hamilton Harbour.

Dr. L.G. Reeds, Chairman of the Department, is adapting for publication his thesis on the Agricultural Geography of Southern Ontario. He is also Vice-Chairman of the Hamilton-Wentworth Planning Area Board. In the summer of 1956 he taught at the University of British Columbia.

Professor H.A. Wood, as Chairman of the Education Committee of the Canadian Association of Geographers has compiled and distributed to teachers a list of air photos and maps depicting landforms and regions of Canada. He is completing research on the regional geography of northern Haiti.

Dr. H.R. Thompson, as Chairman of the Southern Ontario Division of the C.A.G., organized and chaired the annual meeting of the Division, held at McMaster on January 26, 1957. Members of the McMaster Geography Club acted as hosts and co-sponsors for the meeting. In terms of attendance, this was the most successful professional geographers' meeting ever held in Canada; over 150 were present for the papers and nearly 90 attended the evening banquet. The program was a symposium on "Northern Canada Today". Seven invited papers were given in morning and afternoon sessions and Dr. Geoffrey Hattersley-Smith delivered the banquet address. Dr. Thompson is at present engaged in research on the relations between the exploration and the political geography of Antarctica. During the summer of 1956 he taught at the University of British Columbia.

Mr. A.G. Macpherson joined the staff in the fall of 1956. He holds the M.A. degree from Edinburgh University, and his doctoral thesis on Social and Economic Development of the Forfeited Estates in the Scottish Highlands, 1748-1784, is in its final stages. Before coming to McMaster he taught for three years at St. Andrews.

Montreal - Ecole des Hautes Etudes Commerciales.

Le professeur André Journaux (Université de Caen, France) donna une série de cours sur la géographie du commerce et de la circulation dans le monde, en novembre et décembre 1956.

M. Benoît Brouillette a publié deux articles sur les industries manufacturières du Canada dans l'Actualité Economique, Montréal, (avril-juin 1956, 32e année, no.1, p.86-98, 6 cartes, juillet-septembre 1956, 32e année, no.2, p.231-279, 11 cartes). Il a assisté au Congrès International de Géographie à Rio de Janeiro, comme chef de la délégation canadienne, et a profité de son voyage pour visiter avec MM. Dagenais

et Garry le Pérou, la Bolivie, le Chili et l'Argentine. Il fut nommé président de la Commission de l'U.G.I. sur l'enseignement de la géographie.

M. Noël Falaise a repris ses cours à l'Ecole H.E.C., après deux années d'études à l'Université de Paris pour l'obtention d'un diplôme d'études universitaires. Durant son séjour, il visita les principaux pays d'Europe, notamment la Scandinavie et les grandes zones industrielles de la Ruhr, de la Sarre et du centre de l'Angleterre.

M. Gilles Beauregard a donné des cours d'été à l'Ecole de Pédagogie et d'Orientation de l'Université Laval. Il présentera bientôt sa thèse de doctorat à l'Université de Montréal, sur la vallée du Richelieu, monographie géographique.

Du 8 novembre au 13 décembre 1956, l'Ecole H.E.C. a organisé une série de conférences publiques sur "l'aspect géographique des sujets d'actualité". M. André Journaux parla du Maroc, de l'Algérie et de la Yougoslavie; M. Robert Garry, du canal de Suez; M. Pierre Dagenais, du Nouveau-Québec; et M. Benoît Brouillette, de la canalisation du Saint-Laurent. Un public nombreux assista à ces conférences, faites dans l'amphithéâtre de l'Ecole, chaque jeudi soir à 5 heures. Heureuse initiative, qui rappelle aux anciens les conférences données ici par d'illustres géographes, tels que Jean Brunhes et Raoul Blanchard.

Le programme de géographie de l'Ecole H.E.C. a été sensiblement modifié depuis deux ans. Cette discipline figure, comme matière obligatoire, aux quatre années du cours nouveau de Baccalauréat en sciences commerciales, inauguré en septembre 1955. Le programme porte sur la géographie générale en première année, la géographie régionale en deuxième et troisième années, et la géographie économique du Canada en quatrième. Au cours de licence, elle est aussi une matière imposée en première et deuxième années, et une matière facultative en troisième. Le programme de première année de licence est passé de deux à trois heures par semaine, et porte sur l'économie du Canada et des Etats-Unis. Celui de deuxième année traits des principales matières premières du monde (deux heures par semaine), et celui de troisième (une heure) a pour objet d'initier les étudiants avancés à la recherche.

Parmi les thèses présentées pour l'obtention du diplôme de licencié en sciences commerciales, plusieurs portent chaque année sur des sujets géographiques. En mai 1956, on en comptait huit sur trente et une, l'année précédents, neuf sur un même total.

Ottawa

Mr. T. Blachut, Dr. N.L. Nicholson and Dr. M. Sebor were appointed to the part-time staff of the Department of Geography for 1956-57. The department moved to a much more spacious quarters in the newly-completed Arts Building which was opened in the Fall of 1956.

Royal Military College, Kingston

The appointment of Dr. J. Howard Richards to the faculty of R.M.C. marks the beginning of formal instruction in geography at the College. Geography courses are now offered in the third and fourth years and a short course is given at the second year level.

Professor Richards spent May and June of 1956 in the United Kingdom, returning in July to work with the Urban Renewal Study team at Saint John, N.B. Recently he has been working on some problems in historical geography.

Toronto

Dr. D.F. Putnam, in collaboration with Dr. D.P. Kerr, has completed a Geography of Canada for high schools. This book, entitled "A Regional Geography of Canada" has been published by J.M. Dent & Sons, Toronto, Vancouver. In the

summer of 1956, Dr. Kerr and Dr. J. Spelt jointly undertook a study of manufacturing in downtown Toronto. Dr. George Tatham conducted classes in geography for the Army at Kingston, Ontario, during the summer. Since December he is on leave of absence to complete his research on the history of geographic thought. For this purpose he is visiting Germany to study at various centres there, among others at Göttingen. Mr. Georges Potvin was in charge of a party making plans for the redevelopment of St. John, New Brunswick. In the summer of 1956, Mr. Ali Tayyeb lectured at the University of British Columbia Summer School. Dr. D. P. Kerr has left our department to take a position at the University of British Columbia. Dr. Richards and Mr. John Crosby also left the department. Dr. Richards took a position with the Royal Military College at Kingston. Mr. Crosby went to State College at Fresno, California. New members joined the staff. Dr. R. M. Taylor came to us from the University of Washington at Seattle. Mr. W. D. Dean came from United College and Mr. F. B. Watts from the University of Manitoba, both at Winnipeg.

Western Ontario

Professor Pleva has completed the revisions of the Canadian Oxford Atlas and the Canadian Oxford School Atlas, both of which are expected to be published very shortly.

GEOGRAPHICAL BRANCH, OTTAWA

With the appointment of Dr. N. L. Nicholson as Director of the Branch, 1956-57 was a very active year both in the field and in the office. Ten parties were fielded as follows (party leaders' names are underlined). Ice distribution observations in northern Canadian waters were made from C.G.S. D'Iberville during the summer by W. A. Black. Terrain analysis surveys were made on King William Island by J. K. Fraser and W. Henoch; on Cornwallis Island by B. Robitaille and J. G. Trotier; in the Contwoyto Lake area of Mackenzie by J. B. Bird and M. Marsden and on Southampton Island by W. Huard. In southern Canada, M. H. Matheson and R. Drinnan continued their work in Southern Saskatchewan; the urban analysis of Toronto was continued by C. N. Forward, R. Geen, J. Kajioka, H. Wargon, A. Dupuis and F. A. Barrett and F. Grenier, J. Boisvert, J. Lemieux, C. Roberge, J. Buissieres and L. Michaud completed the survey of the City and Port of Quebec. W. A. Black made aerial ice observations over the Gulf of St. Lawrence during the spring of 1957 in collaboration with the R. C. N. and R. C. A. F. and B. Robitaille conducted a special investigation of ice distribution in the lower St. Lawrence River at the same time. In the office meantime great strides were being made with the Atlas of Canada, some 90 per cent of which is now in the hands of the printer. Publication of the Atlas is now confidently expected sometime in 1958.

J. K. Fraser returned from educational leave at Clark University and B. Cornwall began his educational leave at the same institution. The staff of the Branch also suffered some losses. Dr. Camu resigned to join the newly-formed Institut de Géographie at Université Laval and J. K. Stager has resigned and will be joining the Department of Geography at the University of British Columbia in the fall of 1957. Dr. Sebor left to become Professor of geography at Springhill College, Mobile, Alabama and R. Drinnan resigned to become the first geographer in Vancouver's City Hall. It is anticipated that these vacancies will be advertised during the summer of 1957 and all those interested in being notified of the competition to fill them should let the Branch have their summer address.

The Branch published four reports in Geographical Bulletin No. 8, one bibliography and two Geographical Papers (Extracts relating to the Navigability of Canadian Inland Waterways by W. A. Black and Notes on Potential Building Sites in the Bathurst Inlet Area, N. W. T. by J. B. Bird and M. B. Bird.)